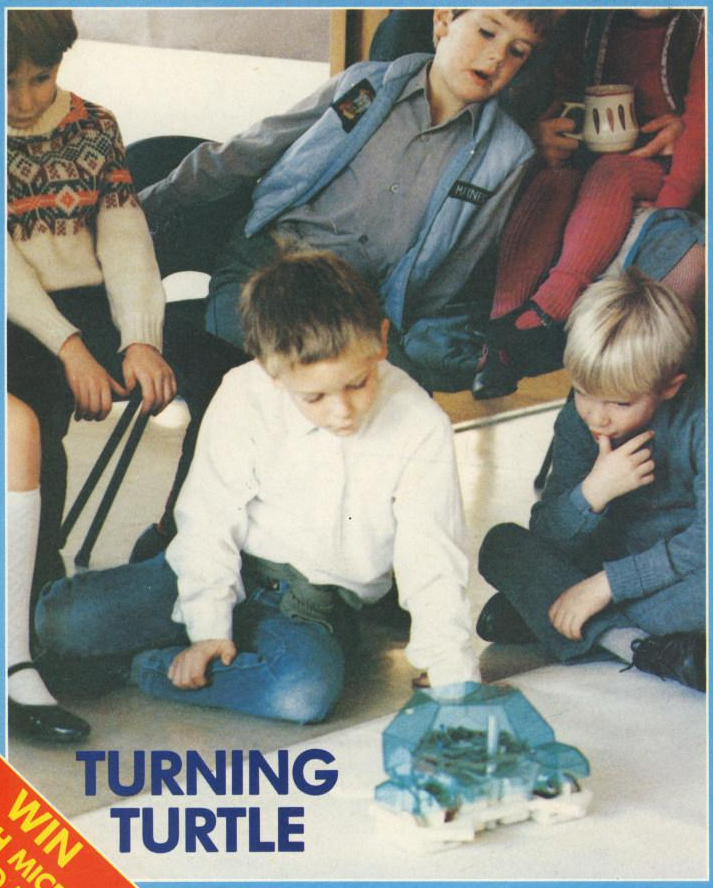
Commodore HORIZONS

The independent Commodore magazine

75p June 1984

COMMODORE SHOW PREVIEW • PLAY APOCALYPSE
GETTING TO GRIPS WITH BASIC COMMANDS



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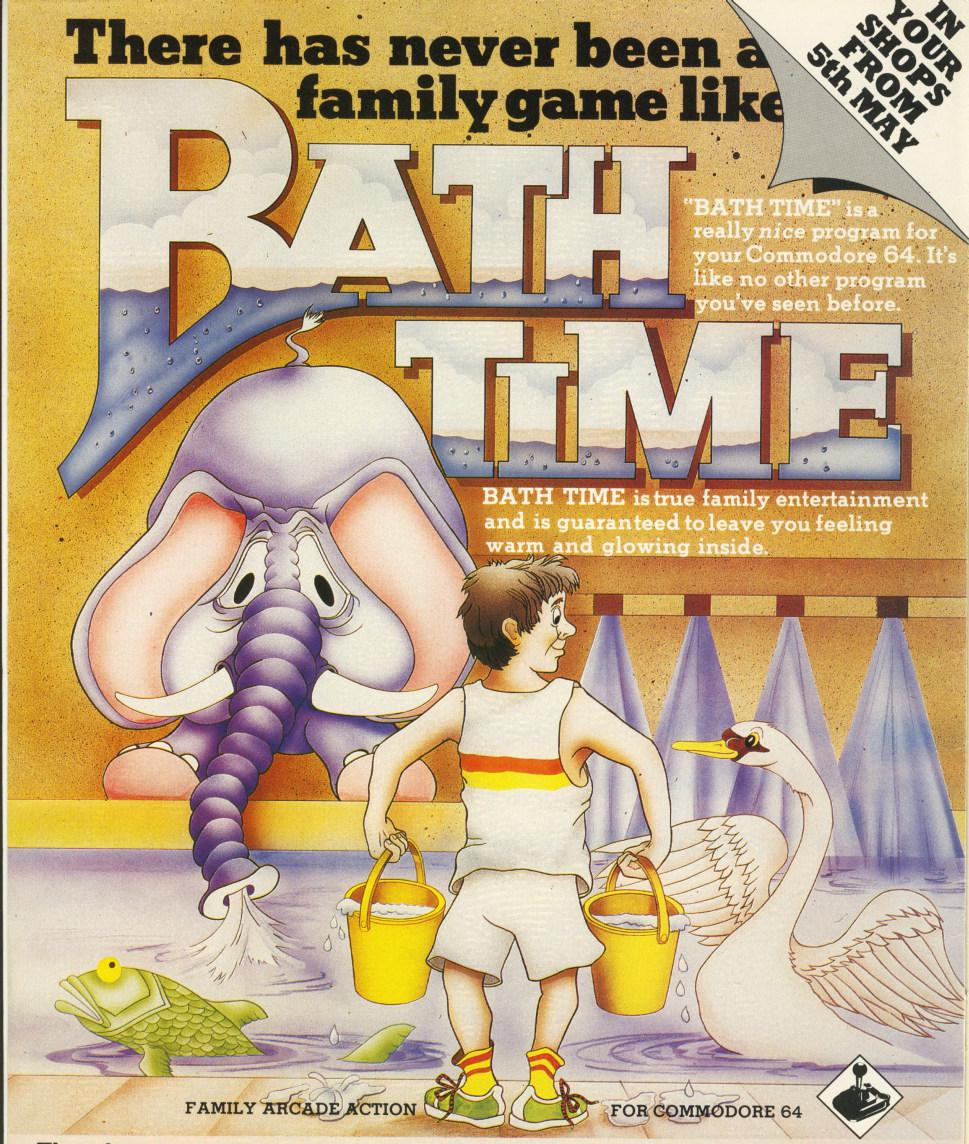

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Commodore HORIZONS
The independent Commodore magazine

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Commodore Horizons welcomes readers' contributions — either articles or program listings. Articles should be typed double-spaced with a wide margin. Programs should, whenever possible, be printed out on plain white paper, accompanied by a cassette. We cannot guarantee to return every article or program submitted, so please keep a copy. If you want to have your program returned you must include a stamped, addressed envelope.

SUNSHINE

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EDITORIAL

IN OLD TIMES it was disputed how many angels could stand on the head of a pin. Modern equivalents include the possibility that a monkey, if left alone for long enough with a typewriter, could produce the works of Shakespeare. We don't know what kind of keyboard could take that amount of battering, but we do suspect that the same monkey is responsible for translating many of the Japanese computer manuals into English. It also looks as though it had a hand in translating some of the press releases Commodore handed out at the recent Hanover trade fair.

The Hanover show is the biggest in Europe — there's even a bus service to take you round the halls. And Commodore was there in force with three models from the range announced earlier this year in the US (the 16, 116 and 264) and two more upmarket machines, an IBM PC clone and a Z8000-based multi-user system running under a Unix operating system. Also along for the ride was the afore-mentioned monkey, celebrating these machines with some fulsome if disjointed press releases. Originally written in German, these releases present an entertaining view of Commodore's activities. For example, we all know that micro manufacturers don't always get products out on time — one release circuits this problem with the handy phrase "one of these models will already be available."

Commodore may have lost out in UK schools but it's done better in West Germany. In fact it's done so well there that "an innumerous number of Commodore computers 64 . . . has been purchased by schools". But Commodore wants to sell more, so it has donated 360 micros to German schools — "these donations are just welcome to serve as triggers". Some aids are also available for "terminating models", although schoolchildren with less lethal interests should be reassured to learn that the various Commodore manuals are all "nonfiction" (we never thought otherwise, honest).

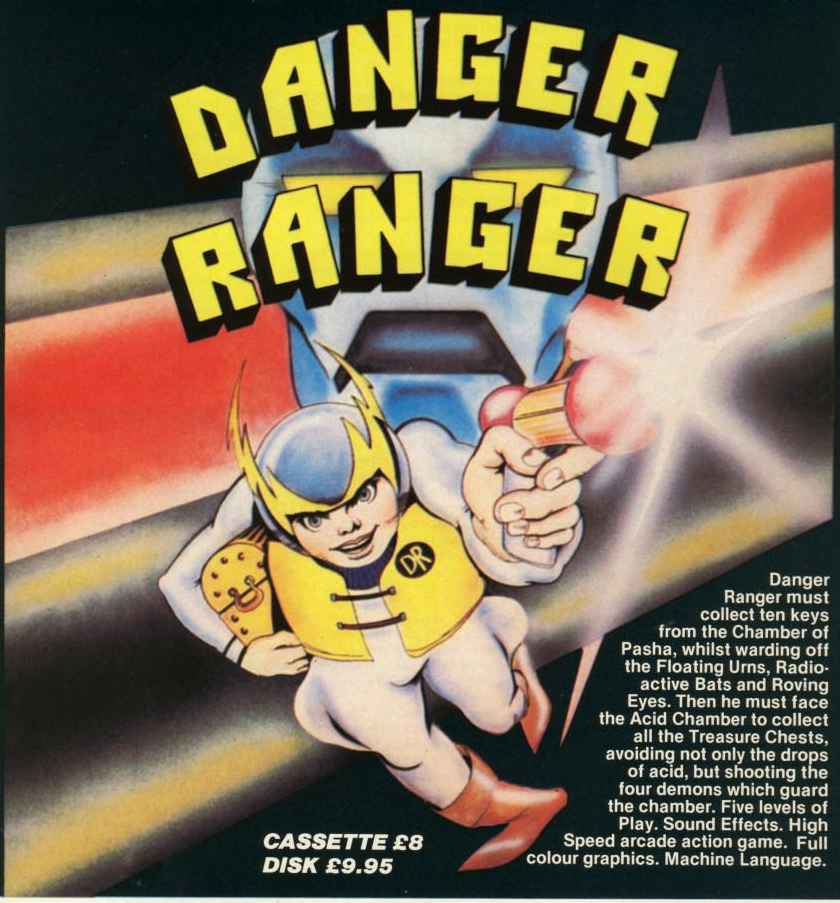
The translation sometimes gives Commodore an unexpected degree of modesty — the 64 has "nearly become a legend" while the new IBM clone can "be considered by a rather large number of customers". But at other times it seems lost for superlatives — Commodore is "by its own statement . . . the only in the microcomputer field" (you can't help but wonder what the missing word is). Some phrases, however, lose nothing at all in translation — the old favourite "extremely favourable price/performance ratio" comes over clear as a bell.

The role of the new bottom end micros gets a little confused. We appreciate that it can be difficult distinguishing between a micro and a minicomputer, but the translation is being a bit optimistic in referring to the 16 and 116 as "minis" — particularly when the photograph of the 16 looks incredibly like a Commodore 64. The bigger memory model, the 264, is more straightforwardly described but is aimed at a very specialised market, the elusive "home and semiprofi" user. The new Unix machine is unsurprisingly called the CBM Z8000, but is surprisingly described as a "micro mainframer". Ah well, it's all interesting stuff even if a little puzzling, and we have to admit that we'd do a worse job translating from English into German. For the moment too it can remain a matter for jest — the serious business will start when the machines make it to the market.

Available for

COMMODORE 64 ATARI 16K
DRAGON 32 TANDY COLOUR

DANGER RANGER



Danger Ranger must collect ten keys from the Chamber of Pasha, whilst warding off the Floating Urns, Radio-active Bats and Roving Eyes. Then he must face the Acid Chamber to collect all the Treasure Chests, avoiding not only the drops of acid, but shooting the four demons which guard the chamber. Five levels of Play. Sound Effects. High Speed arcade action game. Full colour graphics. Machine Language.

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LETTERS PAGE

Galactic replies

YOUR REVIEW of our Games Designer cassette for the Vic 20 in the April issue *Commodore Horizons* has been brought to my attention.

Whilst accepting that reviewers certainly have the right to express their personal opinion, I feel that it is behoven to you to take reasonable precaution to ensure that reviews in your journal are factually accurate and truly representative of the product. In this regard there are certain facts which should be made clear:

a) Galactic Software did not leap on the bandwagon. Our Games Designer for the Vic 20 was released last Autumn at the same time as Quicksilva's Games Designer for the Spectrum. Our program had been many months in preparation prior to release. As also, I understand, had Quicksilva's.

b) Your reviewer has obviously missed the point of the Games Designer. The sample games included are intended as a base on which the user can build. To allow creativity and originality to be developed it is necessary that the samples are not complex.

For your reviewer to simply make a judgement of the games and base his article on that is not fairly representative of the Games Designer.

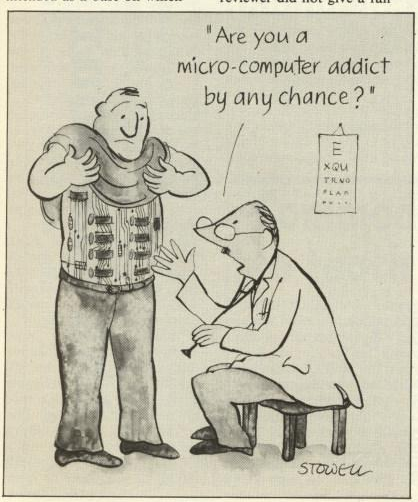
You might be interested to know that other people have a different reaction to this program. We have many letters from satisfied users. Youngsters who are really delighted that they can be creative and original. These people didn't just play the sample games and make instant, incorrect assumptions.

Commodore UK have reviewed the program and concluded it to be of sufficient interest to be supplied to their customers on quite a large scale.

The CBM 64 version of our Games Designer is due for imminent release. It is to be launched by a very large publishing group. As your reviewer hopes, it is indeed a step up from the Vic 20 version. However, I feel that the Vic 20 version is a useful and viable program in its own right, considering the RAM limitations.

To conclude, even allowing for personal opinions, I believe your reviewer did not give a fair representation of the product.

Jim Darling
Managing Director
Galactic Software



Sharp practice

HAVING recently purchased a 64, with which I am very pleased, I must confess to being somewhat disappointed by the apparent sharp practice of leading games software houses. Understandably, the majority of games are first made available to Spectrum users, and subsequently translated for use on other machines.

One would assume therefore that with the 64's superior colour, graphics and sound the resultant program would be at least as good as, if not better than, the original.

Unfortunately, it seems that the reverse happens. Games which receive rave reviews are then hastily transferred to the 64, resulting in an inferior version.

Having got that off my chest, can you tell me if there's any truth in the rumour that Microsoft's superb Flight Simulator for the IBM PC is being translated for the 64?

S J Middleton
Wallington

MICROSOFT says it has no plans to translate the Flight Simulator, but there are flight simulation programs for the 64 available from Anger Production of 14 The Oval, Broxbourne, Herts, from Abbex Software, and shortly from Anirog.

Superior 64

I MUST first congratulate you on a first class magazine and some excellent reviews, especially those on disk drives in the February issue.

Having had my 64 for just three months I am still learning how to operate it to its full capacity. Before my 64 I owned a 48K ZX Spectrum for nine months. If any readers, especially Vic 20 users, are thinking of switching to the Spectrum, my advice is — don't. There is some good software for the Spectrum but the majority is rubbish.

I saw well over 300 games while I had mine, but about 90% weren't worth the tape they were recorded on. The only thing I miss desperately is a Cricket game. Is there one for the 64?

R Young
Sunderland

Return of the Juki

I BOUGHT a 64 intending to use it in my business, for games, and for word processing, I also bought a Juki printer, which performed perfectly with the firm's computers. However, when using it with Easyscript, the Commodore give-away with the disk system, it would sometimes fill the spaces between letters with random symbols.

When I tried VizaWrite the Juki always filled the spaces with random symbols. Commodore finally admitted to me that they had been having problems, and that a team was working with Juki to sort it out.

Eventually Viza Software advised me to contact Microport of Boreham Wood and ask for advice. They suggested I snip out the resistors R24 to R34, which are near the Centromics port. The early Juki seemingly overheats, but that should fix it.

With trepidation I snipped out the resistors — there are only eight — and the Juki now works perfectly, but I still find my hand shaking when I think of it.

If any other readers have the same problem I can't guarantee the repair — but the proof of the tale is that this letter was written on VizaWrite using the Juki and CBM 64.

Mike Woods
Shipley
Yorkshire

This is the chance to air your views — send your tips, complaints and compliments to Letters Page, Commodore Horizons, 12-13 Little Newport Street, London WC2R 3LD

hardware

Prices include VAT and carriage (UK)! If software is ordered at the same time a further discount on hardware of 1% is offered for each £30 software bought (limit is 5% extra discount). For example, ordering £150 or more of software at the same time as package (o) reduces its price by £19.35.

Product	OUR PRICE
(a) Commodore 64	£195
(b) 1530 cassette unit!!	£45
(c) 1541 disk unit	£199
(d) SX64 + £250 software	£850
(e) MS801 printer	£199
(f) 1526 printer	£310
(g) Epson FX80	£400
(h) Epson RX80	£260
(i) 1701 monitor	£210
(j) Parallel interface to link 64 to (g)	£25
(k) Interface to convert any cassette recorder to 64/Vic 20 use	£25

(Offers subject to Commodore supply)

Product	OUR PRICE
(n) Package (a) + (b)	£230
(o) Packe (a) + (c)	£387
(p) Package (a) + (c) + (e) + Easy Scripts, Easy File and Intro to Basic	£620

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software selection

This is a selection of some of the best programs for the Commodore 64 from a list of over 800 we can supply, covering the products of 100+ software houses from the UK, rest of Europe, and the USA. a 20-page listing and later updates are available free to customers (otherwise 50p and large SAE). Add 50p postage for orders under £20. £1 per item on all software orders to Europe.

Please note that the prefix (d) before a price denotes that the program is available on disk (for example d25). The prefix (r) (as in r29) indicates that the program is in cartridge form and costs £29.00. Tape programs prices have no prefix. Thus (d29 16) indicates a disk version at £29.00 and a tape version at £16.00.

WORD PROCESSING

PAPERCLIP (d90) is the most sophisticated and versatile wp program for the 64. Very good too is **VIZAWRITE** (r78 d75) which has a spell-check program **VIZASPELLL** (d20 if bought with **VIZAWRITE**, else d65). But for casual wordprocessing of extreme sophistication we recommend **HOMEWORD** (d35) which is outstanding value and very easy to master. It uses 'icons' to symbolize menu options (as used by Lisa). Contains several really innovative features. Mail label programs available to match.

UTILITIES

DISCO (9.95) can be used to transfer most of your tape-based programs onto disk — a must for all disk users. **DISKEY** (d36) is a really powerful disk editor which enables you to manipulate fully your 1541 and files produced on it. **PROGRAMMER'S UTILITIES** (d14.99) surely represents the best value if you have a disk: sprite, character, and sound editors are provided in addition to a PET emulator, and disk copy utilities — a dozen in all! **COMPACTOR** (d10.50 8.50) cuts out all wasteful programming including REMs and spaces. This can speed up programs and salvage memory. Various good quality sprite and character editors are available including **SUPERFONT 4.0** (6.75) **SPRITES/ GRAPHICS EDITOR (5.99) SPRITEMAKER 64** (5.75). On the music side there's **MUSIC COMPOSER** (r9.99) **ULTISYNTH** (14.95) **SYNTHESOUND** (r25 d25) amongst aothers. **GRAPHIX 64** (d13.50 11) helps you use the fabulous graphics capabilities.

PROGRAMMING AIDS

These range from improvements to C64 BASIC to actual programming aids. **SIMONS BASIC** (r50) adds 114 extra commands and facilities, and the rather better planned program **BC BASIC** (r50 17.95) does must the same. Best of the compilers and excellent value is **PETSPEED** (d50). For database generation we highly recommend **THE LAST ONE** (d95) and **CODE-WRITER** (d85) — both produce standalone code which can be compiled. On the machine code front there are numerous monitors and assemblers the best of which is **MIKRO ASSEMBLER** (r53) but **MONITOR** (r29.95) **ASSEMBLER DEVELOPMENT** (d24.95) **HESMON 64** (r29) and **MASTERCODE ASSEMBLER** (14.95) can all be recommended. If you want to learn about machine code programming we suggest **ASSEMBLER TUTOR (d29.95 29.95) or Honeyfold's BEGINNER'S ASSEMBLY LANGUAGE PROGRAMMING** (14.95). A multifunciton utility which adds many disk commands to the 64 is the highly acclaimed **VICTREE** (r56). **ARROW** (r44) has a TIM monitor, renumber and delete, as well as offering tape LOADs/SAVEs at disk speeds!

DATAFILES/DATABASES

Unquestionably the one program to have if you can afford it is **SUPERBASE 64** (d88) which we have on special offer by way of encouragement! This is a sophisticated programmable relational database. Think of what you would like your database program to do — and SuperBASE will probably be able to do it! Full user support service. **INFODISK** (d73) and **DELPHI'S ORACLE** (d90) are very similar and offer larger individual records but more restricted programming constraints. Multifunction databases include the excellent **MAGPIE 64** (r95) **INFOMAST** (d90) and **VIZASTAR** (d99). All these programs are capable of serious disk-orientated business applications. **DIARY 64** (d30) is a really excellent 'single page' datafile for tape or disk records. For cassette users we recommend the good-value **INFOTAPE** (16.50).

FINANCE & BUSINESS

CALCRESULT is a very sophisticated 3D spreadsheet we highly recommend for serious business uses. **PRACTICALC** (d40 35) is very good value. Also **FUTURE FINANCE** (d75) and **BUSICALC 2** (d79 77). For home accounts there's **BANK MANAGER** (d10 7.50) **HOUSEHOLD FINANCE** (21) **MONEY MANAGER** (9.99) the very sophisticated **HOME ACCOUNTANT** (d52.50) **TIME & MONEY MANAGER** (d49). Busines account programs are available also. These usually form part of a suite of related business programs. For a low cost example **BUSCOM-1, BUSCOM-2, BUSCOM-3** and **BUSCOM-4** are for monthly accounts, wages, retail accounts, and stock system respectively (all d21 19 — demonstration versions at d4.50 2.50 each). For VAT and financial record-keeping and a full audit trail we unreservedly recommend **MICRO SIMPLEX 64** (d175). A professional program perfect for the small business (suits VAT schemes A-F). Demo available against deposit.

RECREATIONAL

We can supply any of the popular games from established software houses and this includes an unbeatable selection of imported material. If there's a program for the 64 . . . we can usually provide it! Also available are a whole series of excellent war and strategy games — **KNIGHTS OF THE DESERT, COMBAT LEADER, EAGLES** (d29 29 each) and others. Learning games for adults include **TYPING TUTOR** (d17.50 15.50) **GRAND MASTER** chess (17.50) and **SPEED READER** (d48). Look out for **ALICE IN WONDERLAND** (d27) and the definitive C64 **FLIGHT SIMULATOR II** (d35). Really good imports include **BLUE MAX** (d25 25) **PROTECTOR II** (d25 25) **FORT APOCALYPSE** (d23 23) **PITSTOP** (r27.50) **JUMPMAN** (d27.50 27.50) and **JUMPMAN JUNIOR** (r27.50) . . . but there are many others! Interested in adventuring? Highly recommended are the following: **COLOSSAL ADVENTURE, ADVENTURE QUEST, DUNGEON ADVENTURE, SNOWBALL, LORDS OF TIME,** and **TWIN KINGDOM VALLEY** (9.50 each), **THE HOBBIT** (14.50), plus Infocom's **ZORK I/II/III, STARCROSS** (d29 each), **WITNESS, DEADLINE, SUSPENDED, ENCHANTER, INFIDEL, PLANETFALL** (d36 each). And No. 64 is complete without **INTERNATIONAL SOCCER** (r9.99) but there are now a host of other CBM cartridge games . . .

Our list includes details of EDUCATIONAL, ACCOUNTING, BUSINESS and GAMES programs not possible to itemize here. PLEASE TRY US IF YOU ARE HAVING DIFFICULTY LOCATING A PROGRAM. Please make cheques/POs payable to The Six-Four Supplies Company.

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NEWS DESK

Lower prices promised

A NEW GAMES software company is set to shake up the industry with its pricing policy. Mastertronic, formed by four video wholesalers, is releasing its first batch of games at £1.99, with ten titles for Commodore machines.

Despite the low prices, all the games are said to have been written by established software houses.

Mastertronic spokesman Alan Sharam commented: "Obviously we intend to make money through high levels of sales. We'll be selling through supermarkets, garages, newsagents, hi-fi and video dealers and multiple stores.

"We believe that software generally is overpriced, and as a new company on the scene we are able to keep our prices low in a way established companies can't."

Alan explained that the international success of CBM micros meant that Mastertronic would be able to sell worldwide. "This is another way in which we'll be able to keep our prices down," he added.

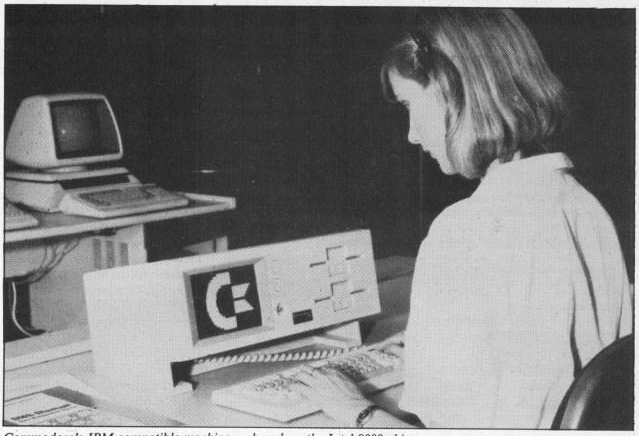
Twenty-one titles were launched in early April, eight of which are for the 64, and two for the Vic 20. Four of these have already been released under different names, but the others are original.

Titles for the 64 include Duck Shoot, Squirm, Bionic Granny and BMX Racers. Vic titles include Vegas Jackpot, Phantom Attack and Sub Hunt.

From the beginning of May, Mastertronic plans to release one game per week. Future plans include educational programs, and adventure and board games which will probably be priced at £2.99.

In contrast Imagine has decided to cancel a planned drop in price for its games from £5.50 to £3.95.

CBM on show



Commodore's IBM-compatible machine — based on the Intel 8008 chip.

THE SHAPE of Commodore's new home computer range is beginning to emerge as the UK launch draws closer.

The bottom-end model with a rubber keyboard has been dropped while another machine, the 16, will come in the 64's familiar housing.

This machine, with 16K of RAM, runs Basic 3.5, as does the 264 which offers 64K — the Vic and 64 use Basic 2. The 264 comes in the newly designed casing shown in our March issue.

Final details on UK pricing and availability are expected in May.

Commodore's two new business micros — one IBM compatible and the other running a Unix operating system — are not expected to be available in the UK until the beginning of next year. Both machines were on show at the recent Hanover Fair, the largest computer show in Europe.

The long-rumoured Unix machine, running the Coherent operating system and based on the Z8000 chip, is aimed at the market for distributed processing. The Hanover model only supports two terminals, but "in future stages eight or more terminals can be connected".

As well as jumping on the Unix bandwagon, the CBM Z8000 joins the rat race — it features a mouse connection.

IBM compatibility is the other obvious market trend at the moment, and Commodore has a foothold there now with its PC. Based on the Intel 8008 chip, this is a portable machine resulting from a licensing agreement with Canadian company Bytec-Comtern. Commodore adds that "a desktop version of this newcomer with a larger screen" is expected later.

Also on show at Hanover were two new printers for the Vic and 64 — the DPS 1101 daisywheel and the seven colour dot matrix MCS 801.

Commodore ready to teach and play

COMMODORE'S latest releases include software and hardware for the 64 and Vic.

In the education field, a new series called BJ Bear will teach 3 to 5 year olds the basic skills necessary for reading, reasoning and mathematics.

The programs, Get Ready to Read, Get Ready for Numbers and Get Ready to Think, can be used with or without the new Magic Voice speech synthesiser. Each program will cost £11.99 on tape or disk, and will include a manual for parents.

Another series, Talking Books, starts off with two packages entitled Magic Garden and Magic Toolbox. Each contains five stories, and is used with Magic Voice to teach children to read, write and learn.

There are several new programs for the Vic 20, including a 100 level arcade game, Rapier Punch, and mediaeval mayhem in Sir Hero. For the expanded Vic there are three new titles, Music Writer, Nursery Song, and Stop Thief.

For the 64 there are Rail Boss, a Western pioneer simulation; Wizard of Wor, a talking arcade game based on the Bally-Midway original; and Zork One and Two, a fantasy adventure based in an underground kingdom.

The price for Vic 20 cassettes is £4.99, CBM 64 disks £11.99, and the Wizard of Wor cartridge is £9.99.

Latest serious software

THE LATEST business and utilities packages for the 64 include a numeric database system, a Pascal compiler and a home budget program.

Saxon Computing's Figaro 64 is a numeric database with the ability to display data in a variety of graphic styles, including bar charts, line graphs, and pie charts, all with text and graphics mixed on the screen. The program includes calculation and statistical routines, as well as security back up options.

Figaro 64 costs £86.25 on disk. Phone 0401-50697 for details.

Oxford Computer Systems has announced a Pascal compiler for the 64. Pascal offers a number of advantages over Basic, not least of which is a speed increase of 5 to 10 times, and a wider range of data types and user-defined structures.

Contact OCS, Hensington Road, Woodstock, Oxford, phone 0993-812700.

Kuma Computers has implemented its Home Budget program on the 64. The program enables the home manager to keep track of finances by building up files of income and expenditures, andusing them in "what if" calculations.

Home Budget costs £9.95. Contact Kuma at 12 Horseshoe Park, Pangbourne, Berkshire, phone 07356-4335.

Dataview's Wordcraft word processor is shortly to be made available for the 64, probably at around £60. The program is said to have been well received in its IBM PC and Apricot versions, and is being heavily promoted for export to Europe and Australasia. Contact Dataview, Portreeves House, East Bay, Colchester, Essex, phone 0206-869414.

Lastly, a mention for Specific Software, whose business accounts program for the 64 and Vic 20 was announced in a previous edition of *Commodore Horizons*. Specific can be found at 10 Farlands Road, Stourbridge, West Midlands, phone 03843-73377.

Add-on spree hits thieves

THIS MONTH sees an unusual selection of Commodore compatible hardware coming on the market.

Micro-Security has announced the Sentinel burglar alarm system, which can be used with the 64 or Vic 20. The system uses an I/O interface cartridge which plugs into the machine's user port.

To this is attached a closed circuit consisting of magnetic reed contact switches which can be attached to doors and windows. Also included is a control unit containing a power supply for an alarm bell, an internal buzzer and an activation switch.

The complete system costs £139.95, and the interface and software alone can be obtained for £44.95.

For further details of the system contact Micro-Security at PO Box 18, Havant, Hampshire.

Graingate has launched a series of transparent PVC keyboard covers for micros, including one suitable for the 64 or Vic 20. The cover is designed to stop dust and dirt causing keyboard malfunctions.

Graingate also markets a range of computer equipment leads, which should soon be available from specialist retailers. Contact Graingate at Unit 9, Bennerley Court, Blenheim Industrial Estate, Bulwell, Nottingham, phone 0602-756096.

A-Line Computer Systems has released a printer buffer for the Epson printer, which can be used with the CBM 64 via an IEEE interface.

The buffer will memorise data sent to it by the 64 at high speed, then send on the information to the printer at a rate the printer will accept. This leaves the computer free to perform other tasks.

A-Line claims that 32K of text, which would take 17 minutes to print without the buffer, can now be transmitted in just over a minute.

Prices for the E-Buffer vary according to memory size and type of interface used. For details contact A-Line at 1 Church Farm Lane, Willoughby Waterleys, Leicestershire, phone 053-758-486.

Lastly, Ikon Computer Products is working on a high-speed storage system based on the Philips mini digital cassette recorder.

The system, known as Ultra-Drive, is already available for the BBC and Dragon machines, and a 64 version is expected around July. The read/write speed of the system should be around 10 times faster than a conventional cassette recorder, and price will reportedly be approximately £80.

Graphics aid

BRITISH MICRO'S Grafpad graphics tablet, originally available for the BBC micro, is now compatible with the CBM 64.

At £125, the tablet is said to be suitable for either computer-aided design, education or artistic applications.

It consists of an oblong drawing surface with a menu control area, and a stylus with a microswitch nib.

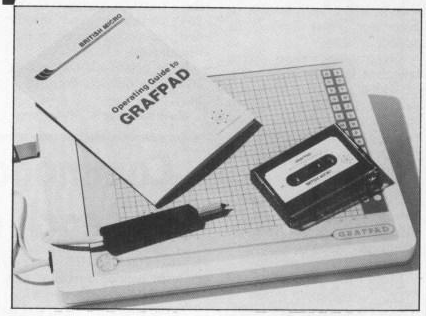
The drawing area is covered with a grid and protected by perspex. By loading the accompanying software, you can draw your own designs on the pad, which are reproduced on the screen. Outlines of maps or pictures can be traced, with a resolution of 320×256 pixels on an area of 240×192mm.

Designs can be saved to disk or tape, and copied to a suitable printer.

The Grafpad package comes with full listings which enable it to be included in users' own programs. The full selection of 16 colours can be used, though only four at a time.

Text can be added to the finished design, and there are a wide range of drawing functions including FILL, CIRCLE, ERASE and LINE.

For more details on the British Micro Grafpad, contact British Micro, Penfold Works, Imperial Way, Watford, Herts, phone 0923-48222.



British Micro's Grafpad — from the BBC to the CBM 64.

Games to all tastes

SEX AND VIOLENCE hit the Commodore world in the latest batch of games releases — although other software houses have found inspiration elsewhere.

Allrian Data has announced a 64 version of the Atari program Strip Poker at £14.99 on disk, with a cassette version available soon.

In much the same vein, Twilight Software is offering Lewdo, for the 64, at £6.95.

On to the violence, with PSS's Quark, a 3-D space simulation for the 64. At £7.95, Quark, which was developed by Andromeda Software (see May's *Commodore Horizons*), features a full cockpit display with a takeoff routine, battle with enemy fighters above a rotating planet, and a landing sequence.

K-Tel, new to the software business, offers City Attak and Odyssey for the 64 at £6.95 each. City Attak features UFOs and ground troops trying to destroy your city, and Odyssey pits you against robo-crabs and alien fleets with only your trusty laser gun to defend you.

On a more peaceful note, CDS has announced the release of 64 Colossus Chess 2.0. Written by chess expert Martin Bryant, the program costs £9.95 on tape and £12.95 on disk. It offers many levels of play by controlling the machine's move time. There are many other features, including a clock display, tutorial aid and save routine.

Audiogenic's latest disk game is Frantic Freddie. Freddie is a telephone line engineer who has to avoid nasty Greeblies while climbing poles to collect pots of gold. At £12.95, Freddie features "funny interludes and silly bonuses", and a specially-composed soundtrack.

English Software is busy transferring successful Atari titles to the 64. The first will be Jet-Boot Jack, at £7.95. Also promised are Stranded, a graphic adventure with more than 35 screens, and Soldier of Fortune, a fast arcade game.

Five adventure games from Richard Shepherd are to be made available on disk, with retailing taking place through the Boots chain as well as computer stores. Titles include Urban Upstart and Ship of the Line, and each disk costs £9.50.

Kuma has announced Paintpic, a drawing facility costing £19.50 on cassette. Paintpic allows a wide range of hi-res drawing facilities on the 64, including mirroring, copying and rotation of portions of the image.

Two releases which should cause a stir in the micro world are still under wraps at the time of writing. Imagine's "megagames", Psyclapse and Bandersnatch, are being advertised as "much more than simple games cassette", although there's little indication of what form the games will take.

Finally, the New Emulator, which reportedly allows Sinclair Spectrum software to be run on the Commodore 64, is eagerly awaited. Retailers Video Vault advertised the program in April, in an apparent excess of enthusiasm for a product which has not yet been fully tested and de-bugged. We'll be reporting on the Emulator as soon as it's available for review.

If you think you've something newsworthy, call 01-437 4343 and let us know

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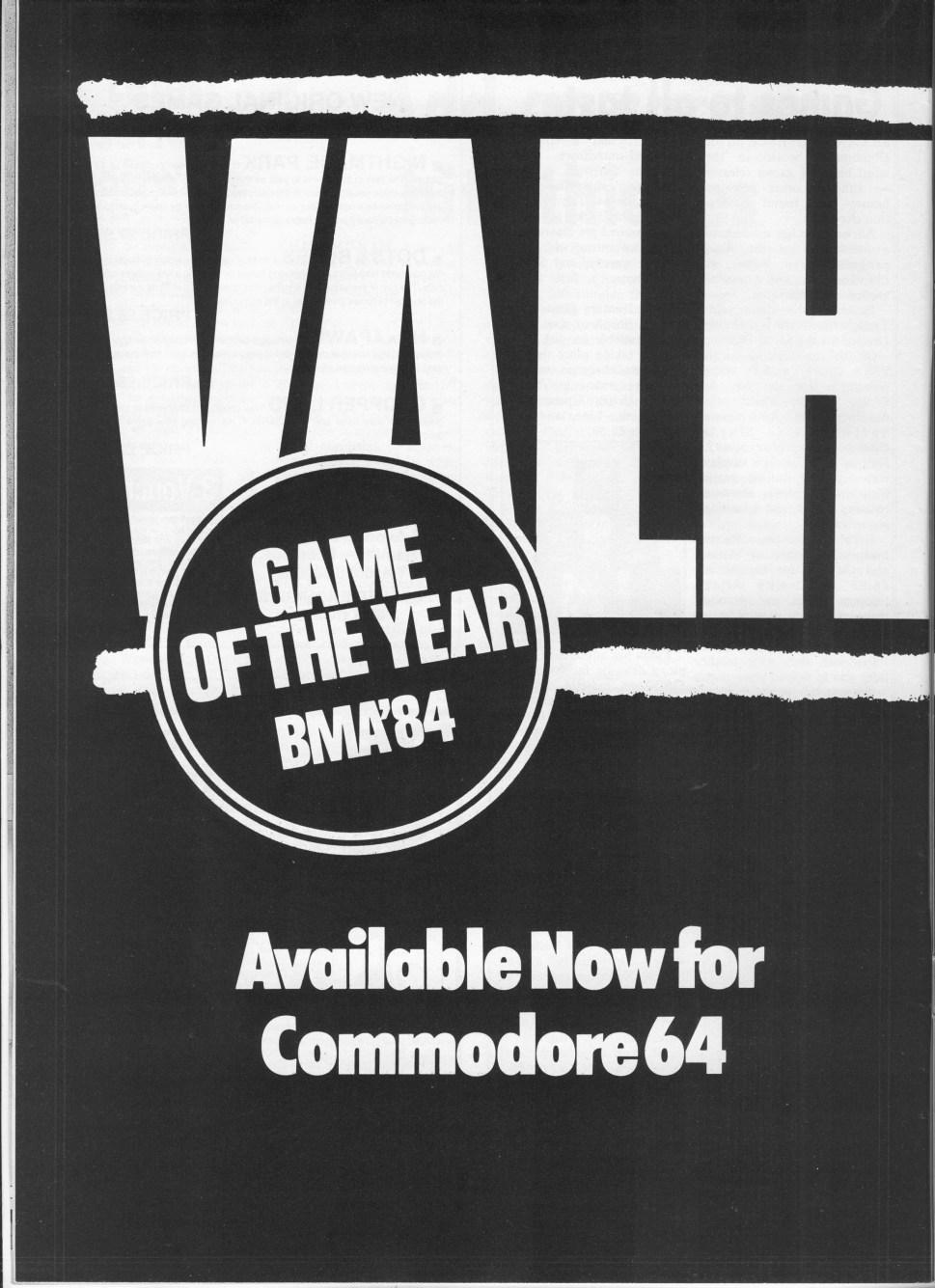
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CH6

Games remain the same

***Pete Gerrard** tackles the dinosaurs and megabeings*

BEING A follower of Monty Python's Flying Circus, the sight of a game for the Vic 20 actually called **Lupin** conjured up wonderful images of masked lunatics riding around everywhere in the eternal quest for lupins. Alas, this game, from Enigma Software of Liverpool, for a Vic with 8K expansion, has nothing to do with characters from Monty Python or indeed, as far as I could tell, very little to do with lupins at all.

Lupin, according to the press release, is a character stung into action by the kidnapping of his girlfriend and her valuable jewellery by the evil Count Von Vic. Being a sensible fellow he decides to rescue the jewellery before the girlfriend, and so the start of the game sees you outside the castle waiting to go in.

Between you and the jewellery and the girlfriend pass a succession of obstacles under the control of the wicked Count, and the object of the game is to survive being chased around the screen by patrol cars, robots and guard dogs and recover all the goodies.

You always start one of your three lives (or four if you achieve mega scores — I never did) at the bottom of the screen next to your getaway van. In front of you is the maze which forms the castle, and along the first row of this maze pass a number of control cars. The longer you play the game, the more cars appear, and (of course) more robots and guard dogs which form the second and third hazards respectively.

Promising

Survive those and you have one more patrol car to leap past before you can get your hands on some of the jewellery. There are 5 items of jewellery to collect on each level (get through 5 levels of this and you actually get to see the girlfriend! She'd better be worth it), although bumping into a guard returns you to your van and any plunder back to where it came from.

Bump into a patrol car, and you not only lose a life, but you also lose any previously acquired jewellery on that level.

The graphics are very good, in this keyboard or joystick game, although someone ought to mention to the programmer that some people do not like having a continuous tune playing throughout the game. Of course, there's always the volume control.

A promising start them, for a new company, but I'm afraid they're very badly let down over their next effort. Any company with the brazen cheek to call one of their releases **The Game** is simply asking for trouble, although it does at lease intrigue you into finding out what it's all about.

The good news is that it's not just another version of Space Invaders. The bad news is that it IS just another version of Pacpeople, complete with ghosts, power pills, and a maze to wonder around it.

It has the virtue of working on the unexpanded Vic 20, and it also allows you to control the game via a joystick or keyboard. There are eight levels of play, ranging from suicidal to snail-like, and apparently you get a new maze to roam around in after you've reached a score of 5,000 points.

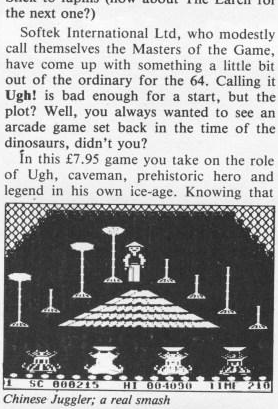
Lose one of your three lives, and all the little pills that you'd gobbled down on that level re-appear again, which I must admit is not a feature I remember from the original. It certainly makes it harder to play.

Apart from that it is simply a version of Pacman. Although the name has changed, The Game remains The Same. Lupin and The Game each cost £5.50.

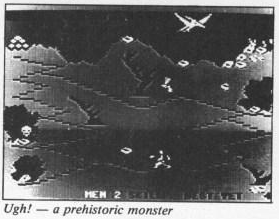
To sum up Enigma Software so far, a bright start, but who on earth persuaded you to bring out a version of Pacthings? Stick to lupins (how about The Larch for the next one?)

Softek International Ltd, who modestly call themselves the Masters of the Game, have come up with something a little bit out of the ordinary for the 64. Calling it **Ugh!** is bad enough for a start, but the plot? Well, you always wanted to see an arcade game set back in the time of the dinosaurs, didn't you?

In this £7.95 game you take on the role of Ugh, caveman, prehistoric hero and legend in his own ice-age. Knowing that the cold weather is a 'comin', Ugh decides to go out on a series of expeditions to stock up food.



Chinese Juggler; a real smash



Ugh! — a prehistoric monster

Pterry the Pterodactyl has fortunately left a large collection of his eggs lying around, and so your first goal in life is to start helping yourself to them. However, Pterry is none too pleased about this little exercise, and responds by aiming sizeable chunks of rock at your head.

Still, armed with your trusty spear you manage to do quite well for a while, and trot up and down your pre-laid out path back to the cave with your booty.

Just when you thought it was safe to go back and taunt a Pterry again, along come two of his friends, Rex the Tyrannosaurus and Trici the Triceratops (very good graphics these), both with the aim of stamping you out. Since they are considerably bigger than you, and Pterry is still aiming pieces of rock at you, your spears come in for a fair amount of use.

You can only carry one spear at a time though, and when all three monsters are tramping about the place life can get pretty hectic.

Ugh! is a pretty good game, but it's perhaps not addictive enough. We await future Softek games with interest.

Chinese Juggler is, so the story goes, a program written as the result of a competition held in dim and distant foreign parts to see if anyone could come up with an original idea for a new computer game. The programmers were then presented with some computer kit and told to get on with it.

Magic

As with most good ideas, this one was really a very old one. You've seen people on television racing around like mad things trying to spin a number of plates at the top of long poles, that always seem to bend alarmingly but rarely topple the plates off. Well, Chinese juggler is an oriental version of that theme.

In this joystick only game, the screen on loading (and a read of the instructions if required), shows a collection of eight poles on which you (the Chinese juggler) have to get eight plates spinning.

The plates are collected from a set of four tables at the bottom of the screen, and thankfully, since the first few games will see you lose enough plates to keep a Greek restaurant happy all night, there seems to be a never ending supply of plates available.

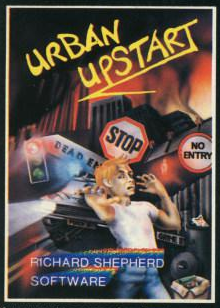
These plates come in a variety of different colours, but for the first level only you must manoeuvre your juggler to any old table and simply grab a plate.

Then, it's a quick jog to one of the poles and, providing the fellow is standing in the appropriate position, placing the plate on the pole. As if by magic, the plate will start spinning immediately, and off you trot back for another one.

The plates do slow down eventually, and rather than fall off and litter the floor they just disappear.

On level two, after getting all eight spinning, the machine is a mite more choosy about what colour it wants the ▶

"ADVENTURES INTO IMAGINATION"



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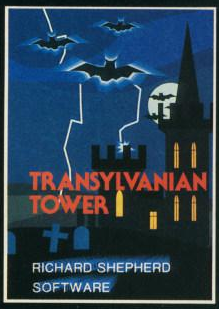

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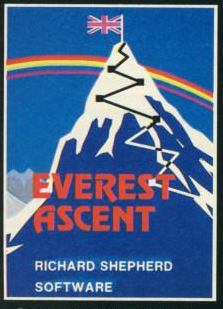

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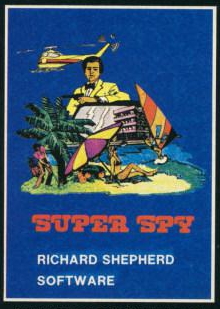

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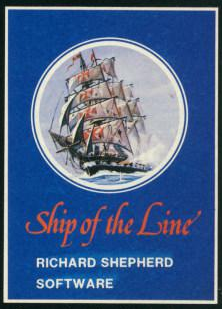

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◀ plates to be, so you'll either have to select a suitable colour from one of the tables, or do a spot of juggling.

By holding a plate and moving from left to right (or vice versa) the juggler throws a plate in the air, then turns around and catches it as it lands. With luck, it will change colour as it spins. Watch out for black plates though, since they always spin so high that they never come down again.

By the time you reach the higher levels, the machine will only accept plates of one colour, and they don't seem to spin for quite as long either.

Graphically interesting (the plates are really well done), but ultimately a little bit tedious, since you spend your time doing exactly the same thing. At £6.90, certainly worth looking at.

Humphrey, you might fondly imagine, would be a game about a little chap who, armed only with a straw, has to go around pinching milk off people's doorsteps, whilst avoiding angry dogs, neighbours, and other inhabitants of the street.

No milk today

But, life is never like you imagine it, and this game of Humphrey for the Commodore 64, at £6.90 from Mr. Micro, owes more to the arcade game Hexpert than it does to the Milk Marketing Board. If you haven't seen the game, a brief resumé.

You are in charge of a character (called, amazingly, Humphrey) who has to leap about a set of what would appear to be building blocks. These are all the same colour at the start of the game, but by jumping onto them you make them change colour.

The object of the game is to change the colour of every block on the screen, whilst avoiding the bombs and any other hazards that the programmers might care to aim at you.

Unfortunately, this version only features bombs, and, again unlike the original, there are a mere fifteen squares to jump onto, which leads to a rather bare looking screen on which to play the game.

Control is by either the joystick or the keyboard, and for once it doesn't really matter which one you use. After you've sat through an advertisement for Mr. Micros, and listened to the very good musical soundtrack for a while, the game actually starts.

Personally, this game leaves me cold. Particularly when, on the very first level, I had just one block to fill and a bomb that was two squares away somehow managed to blow me up! And it didn't only happen the once.

Negotiate level one, and level two has the bomb jumping around two squares at a time. Level three, and you then have two bombs after you, but still only fifteen blocks to fill.

There are much better versions of this sort of game available (Anirog, Audiogenic), so I think this one is, as they say, voted a miss.

Hideous Bill and the Gi-Gants is an unusual little number, from one of the few companies (Virgin Games) who seem capable of responding to criticism of earlier efforts and raising their standards accordingly.

As the copious accompanying notes inform us, this is written by the same chap as their earlier Falcon Patrol, a program that marked something of a turning point for Virgin themselves. People liked it!

This, whilst not an amazingly new idea, is delightfully presented, and there's some interesting use of both graphics and sound throughout.

There are three main levels to survive, and the basic plot covering all three is that you, the Hideous Bill of the title, have to do battle with the horrible Gi-Gants, to rescue your true love Greta. She has been kidnapped and hidden deep on level three, and to get to her a number of hazards must be overcome.

Cunning

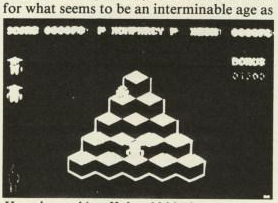
On the first screen, the game would appear to be little more than a variation on a Pacpeople theme, since Bill has to trot around a maze gathering up and crushing ant eggs (just by running over them). The ants themselves chase after you with a fair degree of cunning, and you have just four swords which you can pick up and kill the ants with. These swords, needless to say, disappear after a while.

Remove all the eggs and you're onto level two, much the same as the first, but without any swords. The only twist to the plot is that you must gather a couple of levers hidden inconveniently in the corners of the maze, which open up the doors in the centre of it.

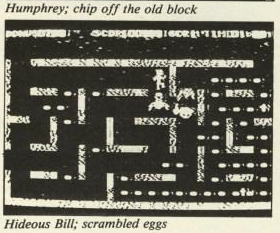
Doing this allows you to grab the can of baked beans (that's what it says here!), which will give you the strength to go on to level three.

Here there are no obvious holes anywhere in the maze, you simply have to bash your way through the walls and crush all the usual collection of ant eggs. Crush them all and you can crash through the final wall and rescue Greta!

If you manage this, you can then sit back for what seems to be an interminable age as Bill and Greta do a lovely bit of rock and roll dancing on the screen. But, while Bill's not looking, one of those deadly ants sneaks out, and . . . it's back to level one again.



Humphrey; chip off the old block



Hideous Bill; scrambled eggs

An interesting and entertaining game at £7.95, that certainly has some nice touches of humour. In particular Bill, when he loses a life to a Gi-Gant, beats his head against the wall and pummels the air in frustration as he slowly caollapses to the floor, still kicking.

Good fun, and a second triumph for young Steve Lee.

You know, there are may things that reviewers have to put up with in the course of a magazine article. Being presented with a sleeveless cassette box because it isn't back from the printers is one of them, and when given **Mega Hawk** (from 'Big G' in Cheshire), there was a total lack of instructions accompanying it.

But on loading this was found to matter not one jot. It works with a joystick (it might work with a keyboard as well, but who knows?), and the rules of this one are very, very simple. If it moves, destroy it, and if it doesn't, well, just destroy it anyway. You might gain some bonus points.

Megabeings

You are in control of the usual sophisticated spaceship, and on the first level of play there are a number of what one must assume are mega hawks flying down the screen at you. In a reasonable impersonation of three dimensions, helped by the space corridor borrowed from Star Wars, these little blighters can also attack you from behind.

The movement of your ship is very quick to respond to the joystick, and a realistic shadow glides across the bottom of the screen as you bob and weave to blast everything in sight.

After a while the mega hawks give up (only temporarily however), to be replaced by giant jumping mega men, who thankfully don't seem to stick around for very long.

The next level sees you deep in space, and here your spaceship can move all over the screen rather than staying near the bottom as it did earlier on. Shooting down a number of spaceships and asteroids allows you to survive for a reasonable amount of time and hit the third (or is it fourth?) level. Here the mega hawks come back, accompanied by mega kangaroos which hop about everywhere, mega birds of another type who fly at you and whom, it would appear, need to be shot a number of times before they squawk their last, and many other mega beings.

Surviving all this lot takes you back to the space corridor once more, with as many mega meanies as I've seen in a long time.

A fast action game, and at £6.95 it will give even the most jaded of arcade addicts a run for their money. All the things needed to make a good game are in there, including some deft touches with the graphics, and whoever Big G are (I still haven't seen that cassette cover!) they deserve to do very well with this one. ■

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Is this the last program you need?

Trevor Doherty looks at The Last One, a program generator for non-programmers

THE BIGGEST drawback to The Last One is its reputation; it must rank as one of the most famous pieces of software around. The early advertising campaign followed up by a product which didn't appear when promised, is much more reminiscent of a hardware manufacturer (mentioning no names but several would fit the description) than a software house. That is all behind The Last One now, what we now have is a perfectly respectable, clever, useful piece of software which is now available for many computers including the Commodore 64.

Described simply, The Last One is the program that writes programs. You define your program in a series of steps in plain English, guided by the prompts on the screen. The Last One asks you further questions to obtain any further information it needs to complete the task then it amazingly writes the program in Basic. The Basic program produced is perfectly ordinary Commodore Basic which can be listed, copied, edited, etc., as though you'd written it yourself.

Manual

The Last One comes attractively packaged as one disk and a nicely printed spiral bound A3 manual. The master disk can be copied, but only five times; clever stuff that, the disk contains hidden identification and the licencing agreement is very specific about what would happen if bootleg copies are traced back to a licencee.

The manual is one of the very best you will come across; it is clear, concise, extremely readable and it even raises a smile or two. Included on the master disk is a 'help' facility which provides a useful précis of each facility which supplements the manual.

The Last One is not, and does not set out to be, a games designer, and therefore does not handle sprites, hi-res, music, and so on. It is intended to create programs which use textual input and output, thus it is useful for creating all sorts of business and technical programs, home record-keeping, club organisation and some types of educational programs.

Now I reckon that any reviewer who just works through a training example, and bases his opinions on that, could easily miss out on any real problems which may be encountered. So having familiarised myself with the training example, I set off to write a program which I had only the previous week failed to get working, writing from scratch in basic, in five hours! The good news is that using The Last One, I had it up and running in one and a half hours, and it was a more robust end product. I also learned some things which are only learnt the hard way, through actual experience.

When I write a program in Basic (I'd describe my programming ability as "adequate") I tend to start off with a core of an idea, code that and get it working, and then start worrying about screen layouts, error trapping and all the 'interfaces' required between the end user and the computer. The latter part, error trapping and so on, usually ends up as 90% of the total task which takes ten times as long as I thought (hoped!) it would. The Last One forces you to get all your ideas 'up front' and put together a list of the operations required in the form of a plain English "flowchart". That's the hard part, particularly if you don't naturally tackle programming in that way.

In effect you have to be the 'systems designer', and The Last One is the programmer. The steps required to create a program are as follows:— first name the files and the format of the fields you want to use. You then construct the flowchart at the keyboard with the help of the "flowchart creation menu".

Any branches in the program are then sorted out with the computer asking further questions. Screen designs are then completed, very easily using the facilities offered on the screen. Error trapping, questions like "Are you sure?" can be added. Screens, once designed, can be saved on disk separately to be used and modified as required later.

Any printer output is similarly designed allowing for page lengths, page numbering, etc. The Last One allows for ASCII printers as well as Commodore printers.

Modify

The Last One then writes the program which you can save on a fresh disk. You can then modify the program at any time in the future, using The Last One, if your needs for your program change.

The main difference between the 64 version and the most versions for business machines (such as the Pet) as far as The Last One is concerned, is the use of a single disk drive and colour. The 64 version copes with both admirably, although having to swap disks every time you use the help facility becomes tedious.

As far as colour is concerned, you set the back ground, border and text colours using the "function" keys during screen design and they are then incorporated into the finished program.

The only facility which The Last One does not touch is sound. You can add sound by including Basic coding as part of your procedure when creating your program, but it still means nine different 'pokes' to produce one 'beep', which is one of the 64's less endearing features.

The feature to modify a program sometime later after creation by The Last One is particularly powerful, and even allows you to modify the actual data file to, for example, allow new fields to be included, unwanted fields to be deleted and the size of other fields changed.

Two tips I can pass on:— firstly, the finished program does not co-exist happily with C-64 Wedge (DOS) on the 1541 disk drive. Secondly, when using The Last One on an SX-64 you must change the character colour using f7 before use — otherwise the background and characters are the same colour!

Manager

If you are a small business user or a home user who cannot find the software you need for a specialised task, The Last One is well worth a look. For example, a cheap bank manager program which I have struggles to cope with my home financial arrangements, which, whilst complex, are fairly typical these days. Using The Last One I can create a program which will cope with two bank accounts, standing orders, a credit card, savings, mortgage, loans, and so on, and which will suit my affairs exactly.

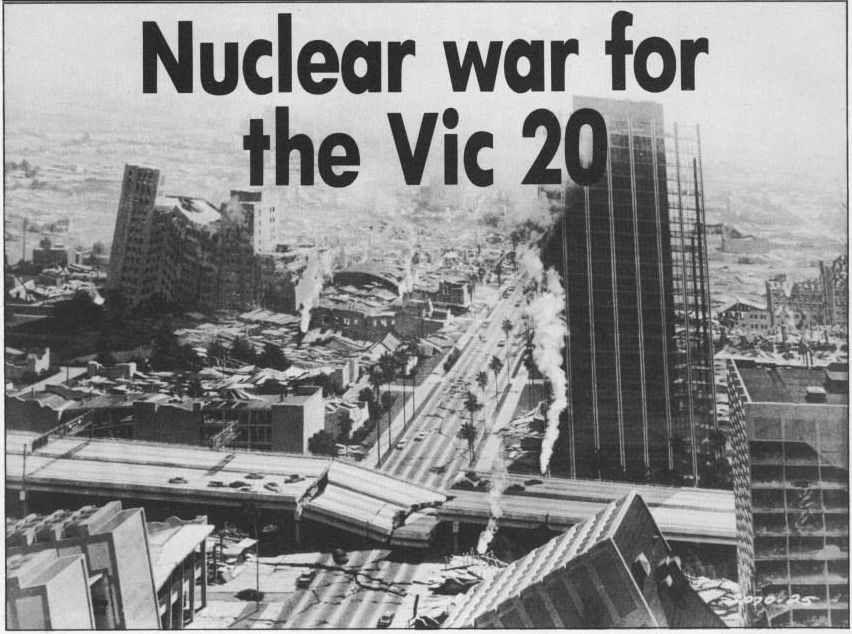
The Last One is undoubtedly a very clever piece of software, it is also an extremely useful one, but not one that every Commodore 64 user would want to rush out and buy. As a person who uses computers professionally as well as at home, this stands out to me, as one of the small bank of programs which started life running on large business machines, and has been converted now to run on what is essentially a home – small business computer, the 64, with no loss in facilities.

It is not instantly "easy to use"; if it were The Last One couldn't be as powerful as it is, but once you have mastered a certain amount and gained confidence, complex programs can be tackled with ease.

The price of £97.50 seems high, but when you consider the (essentially similar) PET version is £199 and the IBM PC version is £330, it begins to look more sensible. There are, of course, other program generators around; The Last One sets the standard by which they are judged.

For further details contact DJAI Systems, Station Road, Illminster, Somerset, phone 04605-4117. ■

Nuclear war for the Vic 20



GLOBAL THERMONUCLEAR WAR is a simulation for the Vic 20 with at least 3K expansion, written by Paul Hearn of Ashford, Kent.

You are in control of a nuclear missile base in Washington DC. The news has just arrived that the USSR has declared war — you must retaliate as soon as possible, but due to computer damage you must first try to guess a three digit personal code before your Battle Computer will open up.

Every time you guess wrong another Soviet missile hits a target in the free world!

Having entered your computer, you are faced with four choices; to set your radar, launch a missile, receive a damage report or terminate the war. You only have 10 missiles to inflict more damage on the enemy than he has caused you. But beware — setting your radar can emit signals which lead to an enemy attack, and not setting it before firing can have even worse consequences! ■

```
 1 DIMI(6)
 4 MR=10:POKE36878,15
 10 POKE36879,25:PRINT"J";
 20 FORR=1TO7
 25 PRINT"X                    "
 30 NEXT
 31 PRINT"X";
 35 FORR=1TO7
 40 PRINT"X******
 41 NEXT
 42 PRINT"XXXXXXXXYOU ARE IN COMMAND OF A USA NUCLEAR MISSILE BASE SITUATED IN
 43 PRINT"XWASHINGTON D.C.":PRINT"X      HIT A KEY"
 44 GETA$:IFA$=""THEN44
 45 POKE36879,42:PRINT"XXXX                                    "
 46 PRINT"X                                                    ";
 47 PRINT"                                                     ";
 48 PRINT"                                                     "
 49 PRINT"XXXXXXXXXXXXXTHE USSR HAVE          DECLARED A    FULL SCALE"
 50 PRINT"NUCLEAR WAR .          TO SAVE THE    PEOPLE YOU"
 51 PRINT"MUST LAUNCH A          COUNTERATTACK";
 52 PRINT"BEFORE THE    WORLDS CITIES          ARE DESTROYED"
 54 PRINT"XXXXXHIT A KEY TO COMMENCE.
 55 GETA$:IFA$=""THEN55
 56 PRINT"J":POKE36879,8:PRINT"X"
 57 FORI=1TO100:POKE8876,INT(RND(1)*128)+128:FORJ=1TO10:NEXTJ,I:POKE36876,0
 59 PRINT"JU.S. NUCLEAR WARFARE  X   COMPUTER READY "
 60 PRINT"XX                                                  "
 62 FORR=1TO3000:NEXT
```

```
63 PRINT"■■■"
64 PRINT"■ALL MISSILES READY FOR■ATTACK."
65 PRINT"■■■ALL SYSTEMS ARE O.K."
66 PRINT"■ ■■PRESS 1"
67 GETA$:IFA$="1"THEN69
68 GOTO67
69 PAB=INT(RND(100)*999)
70 PRINT"■■ENTER THE 3 DIGIT     ■■   PERSONNEL CODE-"
71 PRINT"■■■
```

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415 IFRT=8THENPRINT"■YAKUTSK"
416 IFRT=9THENPRINT"■VOLGOGRAD
417 IFRT=10THENPRINT"■LENINGRAD"
421 RBD=INT(RND(30)*80)+1
422 PRINT"■■■    IT HAS KILLED        ■■ "RBD "■MILLION"
423 ARD=ARD+RBD
424 PRINT"■■■■■■■     HIT SPACE"
425 GETA$:IFA$=""THEN425
426 IFA$=" "THEN80
430 GOTO425
450 PRINT"■":POKE36879,42:PRINT"■":POKE36878,15:GOTO451 :IFMR=0THEN700
451 FORI=1TO10:POKE36874,220:FORJ=1TO100:NEXT:POKE36874,0:FORJ=1TO100:NEXTJ,I
452 PRINT"■■■■    NO DESTINATION■    ■■RADAR NOT SET■                    ■■■■■■■
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Beginning in Basic

***Kevin Bergin** introduces and explains some of the most common Basic commands on the 64 and Vic 20*

THIS MONTH a look at some of the commands offered by Commodore's Basic on the 64 and the Vic.

Firstly we'll deal with variables. The first thing to explain is the object of a variable. Any number or character can be assigned to a variable on all micros using Basic. It takes the form:

10 A = 5000, or
10 A$ = ''THIS IS A STRING''

When this statement is encountered by the 64 or the Vic it assigns the value to the variable. A variable can be any length (remembering the Vic and 64 have limited line length), but they will only recognise the first two characters of the variable name. Therefore a variable named LONG will be recognised by the machines as LO. The only reason for using longer variables is for easy reference. Remember though, the longer the variable the more memory used.

Any variable with the character '$' after becomes a string variable. Other types of variables are numeric, and those with a '%' sign after them, are integer variables. That is a variable which will always be treated as a whole number. The numeric variables always return a numeric value, whereas a string variable will return the contents between the quotes. Very useful for displaying and manipulating information. Try the following in direct mode (without any line numbers).

```
A = 500:REM NUMERIC VARIABLE
  <press return>
A$ = ''NICEDAY'':REM STRING
VARIABLE
  <press return>
PRINT A + A * 2
PRINT LEFT$ (A$,4):REM NICE
PRINT RIGHT$ (A$,3):REM DAY
```

So a collection of characters and various numbers can be assigned values in a program and then manipulated as needed. It is good practice to have sensible variable names e.g. SC for screen. They will be easily recognisable later. On the 64 and the Vic variables do not have to be declared before they are used, but will be initialised by the machines as 0 for a numeric variable and an undeclared string variable will be empty (a null string).

The PRINT command is one of the most powerful and flexible commands in Basic and is relatively easy to use. By using the PRINT command without any quotes, numeric and string values may be displayed, and with quotes a whole range of control characters may be used.

There are a whole range of functions that can be used with the PRINT command. Some of them are listed below along with a brief explanation:

PRINT LEFT$(string,n)

Using LEFT$, the leftmost part of a previously defined string can be displayed. Where 'n' is a number within the range of 0 to 255. This function takes the leftmost part of the string (specified by n) and prints it.

PRINT RIGHT$(string,n)

This function returns the rightmost part of a previously defined string. The part of the string returned is controlled by 'n'.

PRINT MID$(string,n1,n2)

The MID$ function is arguably the most powerful of the three. It returns a sub-string of a previously defined string. The parameter ''n1'' is the start of the sub-string and the parameter ''n2'' sets the length of the sub string.

There are many more commands that can be used with the PRINT command, for instance PEEK, SPC and POS. Consult your manual for details or buy one of the books that contain more detail on the Basic commands. Alternatively watch this space — there may well be more on Basic commands! ▶

```
10 REM *** KEYWORD DEMONSTRATION PROGRA
M
20 REM *** VARIABLES ** SET THEM BEFORE
 WE START
30 MESSAGE$="LEFT$ MID$ RIGHT$"
40 A = 0:A$ = "[10 CD][10 CR][10 CU][10
 CL]"
50 REM *** THE PRINT COMMAND HAS MANY F
UNCTIONS
60 REM *** LOOP
70 FOR LOOP = 0 TO 50
80 PRINT"[CLR];LOOP+A;
90 FOR DELAY = 1 TO 250:NEXT DELAY
100 A = A+1
110 NEXT LOOP
120 REM *** PRINT LOOP AND A TO SEE END
 RESULT
130 PRINT"[CLR]LOOP = ";LOOP;" A = ";A
140 REM *** SCREEN DISPLAY USING PRINT
150 PRINT" CLEARING SCREEN"
160 GOSUB870
170 REM *** PRINTING STRINGS
180 REM *** START COUNT
190 FOR COUNT = 0 TO 25
200 REM *** CLEAR SCREEN ON EACH PASS
210 PRINT"[CLR]"
220 REM *** SET B ON EACH PASS
230 B = INT (RND(1)*LEN(A$))+1
240 REM *** PRINT THE STRINGS
250 PRINT LEFT$(A$,B)+LEFT$(MESSAGE$,6)
260 PRINT RIGHT$(A$,B)+RIGHT$(MESSAGE$,
6)
270 PRINTMID$(A$,B,B)+MID$(MESSAGE$,7,4
)
280 REM *** COUNT TO 1000 BEFORE CONTIN
UING
290 GOSUB870
300 REM *** BRANCH BACK TO START OF LOO
P
310 NEXT COUNT
320 REM *** DELAY LOOP
330 GOSUB870
340 PRINT"[CLR]"LEFT$(A$,19);"PRESS ANY
 KEY"
350 REM *** COLLECT KEY PRESS
360 GET KEY$:IF KEY$ = "" THEN360
370 REM *** SAMPLE OF CHR$ CODES
380 PRINT LEFT$(A$,16);"CLEAR SCREEN =
CHR$(147)
390 FOR DELAY = 0 TO 500:NEXT DELAY
400 PRINT CHR$(147)
410 PRINT LEFT$(A$,19);"[BLK]C[WHT]H[YE
LJA[RED]N[GRN]G[BLK]E [RED]C[YEL]O[BLK]
LO[BLK]UR"
420 GOSUB870
430 REM *** POKE AND PEEK COMMANDS
440 PRINT"[CLR] WE CAN USE THE POKE AND
 PEEK"
450 PRINT"[2 CD] COMMANDS TO CHANGE THE
 SCREEN"
460 PRINT"[2 CD] DISPLAY."
470 PRINT"[2 CD] WATCH THE SCREEN DISPL
AY"
```

Continued on page 24

◀Most of the variables used in the program have been given 'sensible' names, for ease of use and understanding. Also to demonstrate the use of long variables, after entering and RUNning the program, press the RUN–STOP key and enter PRINT ME$ <press return>. The characters returned belong to MESSAGE$, thus only the first two characters were used for the variable by the machine.

Back to the program. The variables MESSAGE$, A and A$ are initialised by lines 30 and 40. Although it is good practice to set up variables at the start of a program, it is not essential. Line 70 is the start of a loop; the count will be from 0 to 50. The screen is cleared by line 80, and the current value of the loop plus the variable A is printed. The semi-colons in the program ensure that the next character is printed in the next screen position, rather than the next line down.

Delay

The statements on line 90 are a delay loop of 250 and line 100 increments 'A'. The NEXT statement on line 110 closes the loop. The name of the loop need not be present, but it is good presentation to include the name. Several FOR. . .NEXT loops may be closed with one NEXT, provided all the names are present. For example, with a statement like NEXT,A,B,C three loops are closed.

The result left after a loop has been exited is often confusing. Line 130 displays the finishing value of LOOP and A. They are one larger than the count specified. This is because the loop is only closed on the pass that contains a number greater than the one specified in the opening FOR statement. Line 150 simply prints a message. One line 160 a branch is made to a routine beginning at line 870. The routine that has been branched to will eventually continue at the statement after the GOSUB. Any GOSUB is closed with a RETURN statement which returns control to the calling routine.

Loops

There is another loop which is entered from line 190. The variable name this time is COUNT; the loop starts from 0 and goes up to 25. The screen is cleared on each pass through the loop by line 210. The variable "B" is set on each pass through the loop. This variable is different from the others, in that it is given a random value. The statement INT returns the integer (whole number) value. The statement LEN, will return the numeric length of a previously defined string.

Therefore on each pass the variable 'B' is reset, and just in case the value is zero, one is added to the result. The result placed in "B" is used as an offset in lines 250, 260 and 270 to display information. The functions LEFT$, RIGHT$ and MID$ are used in lines 250, 260 and 270 and on each pass through the loop they display a message. The statement on line 290 branches to a delay routine, and line 310 closes the loop.

Line 340 clears the screen and uses the LEFT$ function to format a message on the screen. The GET command is used on line 360 to collect a key press. This command takes the format GET<variable>. On line 360 it is set to wait for any key press. A message is displayed by line 380 and line 390 is a delay loop. The screen is cleared by line 400, but this time it is cleared using CHR$(147). The CHR$ codes are again listed in the manuals and more advanced books. It is worthwhile studying them carefully. Below is a sample of the CHR$ codes and their functions:

CHR$ (14), switches to lower case
CHR$ (142), switches to upper case
CHR$ (8), disables the shift key
CHR$ (9), enables the shift key
CHR$ (17), cursor down
CHR$ (145), cursor up
CHR$ (29), cursor right
CHR$ (157), cursor left
CHR$ (19), home's cursor
CHR$ (147), clears screen
CHR$ (18), reverse on
CHR$ (146), reverse off

On with the program again. Line 420 again branches to the delay loop, and lines 440 to 520 clear the screen and display information on the screen. Lines 530 to 580 set up a loop to reverse the character on the screen. This loop uses the two commands POKE and PEEK. The program is written for the 64, so Vic users will have to change the screen displays, which means changing the length of the lines and spaces between lines. Also the POKE and PEEK commands will have to be altered.

Line 530 sets 'SC' to the start of the screen memory. For Vic users line 530 should read:

530 SC = 7680

On line 540 a check is made for the current screen location and if it is less than (<) 128 it is POKEd with the current value plus 128 (reverse it) and a jump (GOTO) is made to line 560. If the check is not true and the screen location is greater▶

```
480 PRINT"[2 CD] CHANGING.  IT IS DONE
WITH"
490 PRINT"[2 CD] A LOOP AND ONLY THE PO
KE"
500 PRINT"[2 CD] AND PEEK COMMANDS."
510 PRINT"[2 CD] PRESS ANY KEY TO EXIT.
"
520 PRINT"[2 CD] HERE WE GO THEN!!!"
530 SC = 1024:REM *** START OF SCREEN M
EMORY
540 IF PEEK (SC) <128 THEN POKE SC,PEEK
 (SC)+128:GOTO560
550 POKE SC,PEEK (SC)-128
560 GET KEY$:IF KEY$ <> "" THEN590
570 SC = SC+1:IF SC = 2023 THEN SC = 10
24
580 GOTO540
590 GOSUB870
600 REM *** MORE POKE AND PEEK WITH COL
OUR CHANGES
610 PRINT"[CLR] HOW ABOUT CHANGING THE
SCREEN"
620 PRINT"[CD] AND BORDER COLOURS"
630 PRINT"[CD] THIS ROUTINE CHANGES THE
 SCREEN"
640 PRINT"[CD] AND BORDER COLOURS AND T
HE COLOUR"
650 PRINT"[CD] LOOP CHANGES THE COLOUR
LOOP."
660 PRINT"[CD] TO SEE THIS AGAIN PRESS
F1"
670 PRINT"[CD] TO EXIT THIS ROUTINE PRE
SS F3."
680 PRINT"[CD] THERE ARE MANY FUNCTIONS
 POSSIBLE"
690 PRINT"[CD] USING THE POKE COMMAND.
 THIS"
700 PRINT"[CD] IS JUST A SMALL EXAMPLE
TO GIVE"
710 PRINT"[CD] THE GENERAL IDEA!!"
720 PRINT"[CD] PRESS 'F1' OR 'F3' ANY T
IME"
730 FOR LOOP = 0 TO 14
740 POKE 53280,LOOP
750 POKE 53281,LOOP+1
760 FOR COLOUR = 55296 TO 56295
770 POKE COLOUR,LOOP
780 NEXT COLOUR
790 GET KEY$:IF KEY$ <> "" THEN820
800 NEXT LOOP
810 GET KEY$:IF KEY$ <> "[F1]" AND KEY$
 <> "[F3]" THEN810
820 IF KEY$ <> "[F1]" AND KEY$ <> "[F3]
" THEN800
830 IF KEY$ = "[F1]" THEN610
840 IF KEY$ <> "[F3]" THEN820
850 POKE 53281,6:POKE 53280,14:PRINT"[C
LR][LT BLU]";:END
860 REM *** DELAY ROUTINE
870 FOR DELAY = 0 TO 1000
880 NEXT DELAY
890 RETURN
```

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◀than 128 the program goes to line 550. Line 550 pokes back the original unreversed value by subtracting 128 from the current screen location using the PEEK command. Line 560 checks for a key press. If a key is pressed then the routine is exited. Line 570 increments 'SC' (screen location) and checks for the end of the screen; if the end of the screen has been reached 'SC' is reset to the first screen location. For Vic users line 570 should read:

570 SC = SC + 1:IF SC = 8185 THEN SC = 7680

Line 580 is a jump back to start the routine again with the next screen location. The line length has been kept short, but the Vic will take 88 characters per line and the 64 will take 80 characters. You will also find that the statements may be tokenised allowing more characters per line. Tokenised characters will be displayed in full when listed. For details of the tokens see your manual.

Border

At this section of the program. lines 610 to 850 use the POKE command to change the border and screen colours, as well as the character colour. The first section, lines 610 to 720, displays information. Again Vic users will need to re-format this. Then on line 730 a loop counting from 0 to 14 is set up. Line 740 changes the border colour using the current value of 'LOOP', and line 750 changes the screen colour also using the current value of 'LOOP' plus 1.

Line 760 starts another loop inside of a loop. This is called 'nesting'. GOSUBs can also be nested. The loops must be closed in order, so in our case the loop "COLOUR" must be closed first. The loop "COLOUR" is set from 55296 to 56295; this is the colour RAM. By changing this (values 0 to 15) we can change the colour of the characters on the screen. Line 770 POKEs the current value of the loop "COLOUR" with the current value of "LOOP". Line 780 close the loop "COLOUR".

Key press

A GET command is on line 790 to check for a key press. If a key is pressed the program jumps to line 820. Line 800 closes the loop "LOOP". Line 810 waits for another key press; this time it will only accept the F1 or F3 key. If the F1 key is pressed the routine is started again,a nd if the F3 key is pressed the program ends. Line 820 checks to see if the key press was the F1 key or the F3 key; if not a jump to line 800 is made.

At line 830 the routine is re-started if the F1 key was pressed, and line 840 jumps back to the check line if the key press was not F3 (end the program). Line 850 resets the machine. For Vic users line 850 should read:

850POKE36879,27:PRINT "[CLR][BLU];:END

The last routine from line 870 to line 890 is the delay routine called from GOSUB's within the program. Vic users will need the routine from line 730 to 840 altered. Below is a listing for the Vic:

```
730 FOR LOOP = 0 TO 128 STEP 16
740 POKE
36879,LOOP + INT(RND(0)*10)
750 REM THIS LINE IS NOT NEEDED
ON THE VIC
760 FOR COLOUR = 38400 TO 38905
770 POKE COLOUR,LOOP
780 NEXT COLOUR
790 GET KEY$:IF KEY$ < > " " THEN
820
800 NEXT LOOP
810 GET KEY$: IF KEY$<>"F1"AND
KEY$ < >"F3" THEN 810
```

That is all for this month. The listing was printed on an Epson FX-80 as it produces a more readable listing. The control graphics were removed and replaced with substitutes. Below is a table:

```
[CD] = CURSOR DOWN
[CR] = CURSOR RIGHT
[CL] = CURSOR LEFT
[CU] = CURSOR UP
[CLR] = SHIFT AND CLR – HOME
[HME] = CLR – HOME
[F1]—[F8] = FUNCTION KEYS
[BLK] = CTRL & 1
[WHT] = CTRL & 2
[RED] = CTRL & 3
[CYN] = CTRL & 4
[PUR] = CTRL & 5
[GRN] = CTRL & 6
[BLU] = CTRL & 7
[YEL] = CTRL & 8
[LT BLU] = LOGO & 7
```

■

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HORIZONS
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June 1984

Welcome to the Commodore computer show

The only place for Commodore owners to be on the 7th, 8th and 9th of June is the Novotel Hotel in London (the Cunard under a new name) — the venue for the Fifth International Commodore Computer Show. Situated in Talgarth Rd, W6, just along from Hammersmith underground station on the Piccadilly, District and Metropolitan lines, the hotel will be packed with exhibitors offering the latest software and hardware. Inside this preview you'll find information on who'll be there and what they'll be doing. A second show is being held at the Leeds Exhibition Centre on 27-29 September.

And to make a trip to the Novotel even more worthwhile Commodore is offering readers of this magazine who visit the show a chance to win one of its 1541 disk drive units. All you have to do is list in descending order the six products at the show you found the most interesting. Once you've done this fill in your name and address and then hand in the form at the Sunshine stand. The winner will be the person whose choice comes nearest to our own and whose reasons are the most convincing — although we're open to persuasion if your reasons are particularly good. The winner's name will be announced in our August issue.

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3.....	.....
4.....	.....
5.....	.....
6.....	.....

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.....

COMMODORE SHOW PREVIEW

What the people say!

"I have a recurring problem, my Dad is always playing EXTERMINATOR when I want to" *Craig Horsfield – Blackburn.*

"Thank you for a game with no loading or playing problems, my son is very pleased with it" – *Mrs Pritchard, Llanfairpwll.*

"I would like to congratulate you on your excellent game for the Commodore 64 – HUSTLER. I found this game very entertaining with brilliant sound and graphics" – *Stuart Adair, Runcorn.*

"After purchasing my Commodore 64, I proceeded to purchase many software games for both me and my children. The 'Commodore' and the 'bleep' I find are very poor compared to yours. Can you please send me a brochure or a list or – better still – can you send me a few and enclose the bill." *H. Stephenson, Sheffield.*

"I have just purchased the Bubble Bus game EXTERMINATOR. I would like to congratulate you on a brilliant game. The sprite graphics are really good, non flicker – and smooth! Also the use of colour and sound is great." *Alan Shepherd.*

"May I say I think HUSTLER is great" – *Iain Adan, New Pitsligo.*

"I recently purchased your 'WORD WIZARD' cassette. I must congratulate you on a wonderful piece of software which represents excellent value for money. This is the third Bubble Bus cassette I have bought – the two others are 'HUSTLER' and 'EXTERMINATOR', both of which are also brilliant" – *Mike Dessau, Israel.*

What the papers say!

HUSTLER

"Another Gem" *Commodore Computing.*
"Top rate game" *Computer Choice.*
"The graphics and colour are superb" *Commodore User.*
"To pool freaks it's a must" *Personal Computing Today.*
"It's a must for the collection even if you're not a pool fanatic" *Commodore Computing.*

EXTERMINATOR

"The sheer speed of action keeps you more firmly pressed to the screen" *Commodore User.*
"The player will stumble away from the Computer, his head reeling with wild sounds, only to be drawn back to get his next 'fix', for by now he will be so totally addicted only a power failure will be able to release him" *Commodore Computing.*
"Value for money 100%" 5 star rating *Home Computing Weekly.*
"Finger pressing good" *Personal Computing Today.*

KICK OFF

"Great fun. Addicts of the original Table Football game will find this comes well up to expectations" *Personal Computer News.*
"Anyone looking for something 'different' or fans of the actual game will appreciate this quality offering." "Excellent game." *Commodore Horizons.*

WIDOWS REVENGE

"Challenging and great fun to play" *P. C. Games*
"Whole new ball game" "A good bet for all '64 owners" *Commodore User.*

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Company *Adamsoft*
Stand *A111*
Address *18 Norwich Avenue, Rochdale, Lancs*
Phone *0706 524304*
ADAMSOFT is a distributor of software for the Commodore 64 and Vic 20, specialising in utility programs from Abacus Software, USA. The range includes Synthy-64, which makes it easy to write sophisticated music on the 64 and Ultrabasic-64, which makes it easy to write sophisticated music on the 64 and Ultrabasic-64, which adds 50 powerful commands for hi-res graphics, turtle graphics, sprites and much more.

New languages available include Zoom Pascal for the CBM 64, which produces fast machine code programs that can run independently on any 64. Tiny Forth for the Vic and CBM 64 is not as tiny as it sounds, and you can add your own commands.

Company *Adman Electronics*
Stand *135A*
Address *Ripon Way, Ripon Road, Harrogate, North Yorkshire*
Phone *0423 62642*
ADMAN Electronics is featuring its new Speech Synthesiser for the Commodore 64. The unit is based on allophone word construction and incorporates the 64 parts of speech. These can be used to construct any word in English and will work with most foreign languages.

Also on show are the Adman Vic 20 range which includes a Speech Synthesiser with the same features as for the 64, a 16K and 8K RAM pack and a 3-port motherboard.

Company *Anagram Systems*
Stand *D19*
Address *60A Queen Street, Horsham, West Sussex*
Phone *0403 59551*
ANAGRAM is featuring business and home software.

On the business front are Anagram's Integrated Accounting System, version 4, and Stock Master, both available for either the 700 or 8000 series.

For the home computer Anagram is showing the new Cash Book 64 program, the ideal accounting package for the small business or self-employed person.

Company *Anirog*
Stand *133, 134, 137 and 138*
Address *29 West Hill, Dartford Kent*
Phone *(0322) 92513*
ANIROG is proud to present its latest releases for the Commodore 64 and Vic 20.

Artkit, a superb program for people of all ages and for budding programmers, can be used to draw and colour in high resolution graphics using the keyboard. It comes complete with Melody Maker, a comprehensive music synthesiser. Both pictures and msuic can be saved and used in your own program.

Anirog also presents its first totally disk based multi-screen adventure. Jungle Drums, a danger-ridden safari, combines action and adventure in one hugely entertaining game. In a lighter vein, the antics of Pengo as he tries to crush his enemies by moving ice cubes around the screen are amusing and form a very addictive game.

Company *Applied Systems Knowledge*
Stand *128*
Address *London House, 68 Upper Richmond Road, London SW15*
Phone *01-874 6046*
IF YOU'RE bored with just arcade games, have a look at ASK's latest range of educational games for the 64: Number Painter — a maths game with a Panic-like screen layout, but with far more challenge in its 12 levels. Number Chaser — an estimating game based around a car race.
Words Words Words — a program with a vocabulary of over 100 words, all illustrated in high resolution graphics scenes that are animated.

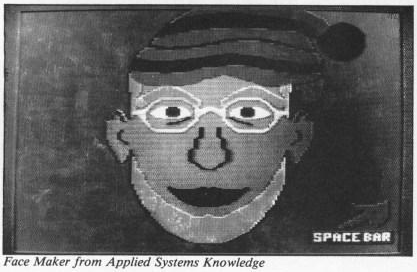
Then there's Facemaker — a great range of faces to draw; Let's Count — a first counting program; Hide and Seek — a memory concentration game with over 70 different objects; and Number Puzzler — a noughts and crosses type game of addition and subtraction where strategy is all important.

Company *APS Microsystems*
Stand *B37*
Address *6-8 Foredown Drive, Portslade, Brighton, Sussex*
Phone *0273 420195*
APS Microsystems is featuring its Alpha 10 and Beta 5 removable cartridge mass storage systems, which hold respectively 20 megabyte and 10 megabyte of data on twin disk drives in either stacked or side-by-side configuration.

The system, which is new to Britain, works on the Bernoulli principle and gives the same access speed as a Winchester together with a phenomenal data transfer rate of megabyte a second.

Company *Audiogenic*
Stand *101 and 102*
Address *39 Suttons Industrial Park, London Rd, Reading, Berks*
Phone *0734 664646*
AS THE leading independent supplier of software for Commodore machines, Audiogenic is using the Commodore show to exhibit a new range of games unsurpassed in quality, graphics, sound and presentation.

Chief among these is the game you've all heard about — the amazing Alice in Videoland.



Face Maker from Applied Systems Knowledge

Come and be amazed by the Koala Pad — the latest graphics tablet for the 64 with amazing software that gives you all sorts of facilities for drawing onto the screen in full hi-res colour.

Last, but definitely not least, on the business side Audiogenic is launching Swift — its spreadsheet program for the 64 — with facilities rivalled only by the likes of Lotus 1-2-3. Magpie, the state-of-the-art database system for the 64, will of course be there also.

Company *Bubble Bus*
Stand *113 and 127*
Address *87 High St, Tonbridge, Kent*
Phone *0732 355962*
BLOOD, SWEAT and tears! These are the three ingredients we're putting into our three new Commodore 64 games — exactly the same ingredients you can expect to get out of the games once you have played them.

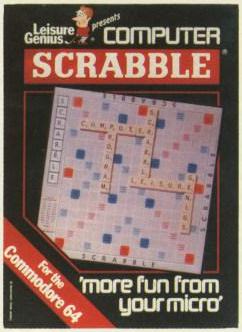
Come to our stand and all will be revealed. These three games again reach our very high standards — we use the best techniques to produce real winners. Bubbling away in the depths of our granary in darkest Kent our programmers have been completing these exciting games. They are the ultimate in 3D war games, the first adventure game from Bubble Bus and a superb arcade action game. All with super graphics and super sounds.

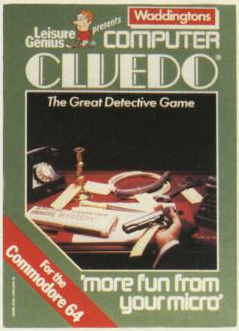
Company *Commodore*
Stand *000*
Address *675 Ajax Avenue, Trading Estate, Slough, Berks*
Phone *0753 74111*
COMMODORE itself is showing its latest products including the 16 and 264 home computers, along with previews of its new business micros, the Commodore PC and Z8000, and the latest news on the Compunet database service.

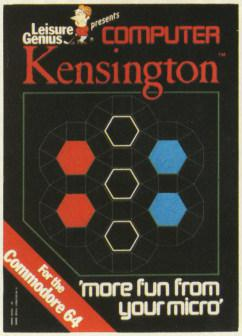
Special guests are expected, for example Patrick Moore demonstrating his Commodore Astronomy program on the 64.

Games and competitions include a chance to test your skill at Commodore's latest business game — and to enter the Commodore International Art Computer Challenge.

Ingenious...







Computer games for people who hate computer games.

Give your joystick a rest, and your brain a chance with these family favourites.

Machine code programs for the Commodore 64, and coming soon for the Spectrum and BBC/B.

Software by...

Leisure Genius®

3 Montagu Row. London W1H 1AB

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Websters Software. Telephone: 0483 62222

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JUST WHEN YOU THOUGHT IT WAS SAFE TO GO BACK INTO THE JUNGLE.

PITFALL II. STARRING PITFALL HARRY AND INTRODUCING RHONDA & QUICKCLAW WITH ANDEAN CONDORS, VAMPIRE BATS, POISONOUS FROGS, ELECTRIC EELS, ALBINO SCORPIONS AND CAVE RAT AS HIMSELF. DESIGNED AND DIRECTED BY DAVID "PITFALL" CRANE.

AN ACTIVISION PRODUCTION. FOR THE ATARI 2600, ATARI HOME COMPUTERS, COLECOVISION, COMMODORE 64 CASSETTE AND DISK.

PITFALL II IS A REGISTERED TRADE MARK OF ACTIVISION INTERNATIONAL INC.

ADMAN ELECTRONICS

SPEECH SYNTHESISER NOW AVAILABLE FOR COMMODORE 64 PRICE AROUND £49.95

The Commodore 64 finds its voice!

Vic 20 computers have been talking back to their owners for quite some time. Now, Commodore 64 users can have that same pleasure too—by getting an ADMAN SPEECH SYNTHESISER! It's word power is endless as there is no set vocabulary. Yet operation is simple. The 64 elements of English speech are pre-programmed to let you put your words together as soon as you switch on. Just imagine....you'll be able to program your own adventure games with characters that can actually talk. **Many leading software houses are now developing programs that are compatible with the Adman 64 Speech Synthesiser.**

First releases are:
Twin Kingdom Valley (Bug—Byte) Attack—Attack (Voyager) 3D Silicon Fish (Thor Computor Software)

For Vic 20 users there are also 8k and 16k RAM PACKS and a 3 PORT EXPANSION MOTHERBOARD.

Prices around:

8k Ram Pack	**£29.95**
16k Ram Pack	**£39.95**
Motherboard	**£19.95**
Speech Synthesiser . .	**£49.95**

Adman computer accessories are available from all good computer shops. For futher information, why not take a lead from our speech synthesiser....ask for it! See you local dealer or simply post the coupon.

Dept. C, Adman Electronics Ltd., Ripon Way, Harrogate, N.Yorks, HG1 2AU. Tel. 0621 740972

Adman Electronics Ltd. is a member of the Adam Leisure Group PLC

Please send me information on Adman Vic 20 Accessories

Name _____

Address _____

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5/84 64/Commodore Horizons

Home Computer Centre

208 Aigburth Road, Liverpool L17 9PE
Tel. 051-727 8050

ASTERFRET TRADING LTD INCORPORATES HOME COMPUTER CENTRE

VIC 20 and CBM 64 are reg'd trade marks Commodore Business Machines

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on orders of two or more products.

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4 SLOT SWITCHABLE MOTHERBOARD	£29.95
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PIXSTIK (inc. Paintbox & 3 Games)	£29.95
QUICKSHOT II JOYSTICK	£12.95

For the VIC-20

16K STANDARD RAM PACK	£27.95
16K SWITCHABLE RAM PACK	£35.95
32K SWITCHABLE RAM PACK	£49.95
64K RAM PACK + 2K EPROM	£64.35
2 SLOT MOTHERBOARD	£ 6.85
4 SLOT SWITCHABLE MOTHERBOARD	£28.95
5 SLOT SWITCHABLE/ BUFFERED MOTHERBOARD	£34.45
40/80 COLUMN CARD	£64.95
PIXSTIK (inc. Paintbox & 3 Games)	£29.95
QUICKSHOT II JOYSTICK	£12.95

All products are fully guaranteed

FOR FURTHER INFORMATION ON ANY OF THE ABOVE PRODUCTS, PLEASE CONTACT US AT THE ABOVE ADDRESS.

Company *Computer Bookshops*
Stand *A133*
Address *30 Lincoln Road, Otton, Birmingham*
Phone *021 707 7544*
COMPUTER Bookshops wholesales books and software to the retail trade and offers titles from approximately 40 major US and UK publishers besides being sole UK distributor for Sybex and Compusoft Publishing.

Best selling books relevant to the Commodore 64 and Vic 20 are on display together with titles covering general books in microcomputing and other popular home computers.

Company *Dataview Wordcraft*
Stand *B35*
Address *Radix House, East Street, Colchester*
Phone *0206 869414*
ONE OF the leading publishers of micro computer software, Dataview specialises in professional business programs. Its products have been bought by well over 50,000 users in Britain alone.

At the show Dataview is launching a new range of business packages to run on the Commodore 64, SX64 and 700 machines.

Company *Duckworth*
Stand *A147*
Address *The Old Piano Factory, 43 Gloucester Crescent, London NW1*
Phone *01 485 3484*
DUCKWORTH is showing a wide range of books and software: games and utilities for the 64 and Vic machines, and best-selling books such as *Using the Commodore 64.*

Peter Gerrard, former editor of *Commodore Computing Internatinal,* is a regular contributor to *Commodore Horizons, Popular Computing Weekly, Which Micro?* and *Software Review.*

Kevin Bergin is a regular contributor to *Personal Computer News, Commodore Horizons, Which Micro?* and *Popular Computing Weekly.*

Company *Galactic Software*
Stand *A129*
Address *Unit 7, Larchfield Estate, Dowlish Ford, Ilminster, Somerset*
Phone *04605 5161*
GALACTIC Software is showing the successful Games Designer program for the Vic.

Galactic also produces a wide range of arcade-type software for the Vic 20 and Commodore 64.

Company *Granada Computer Books*
Stand *A54*
Address *8 Grafton St, London W1*
Phone *01 493 7070*
GRANADA leads the field in personal computer books. Our full range, including many titles on the Commodore 64, is on display at the show and we welcome visitors to our stand.

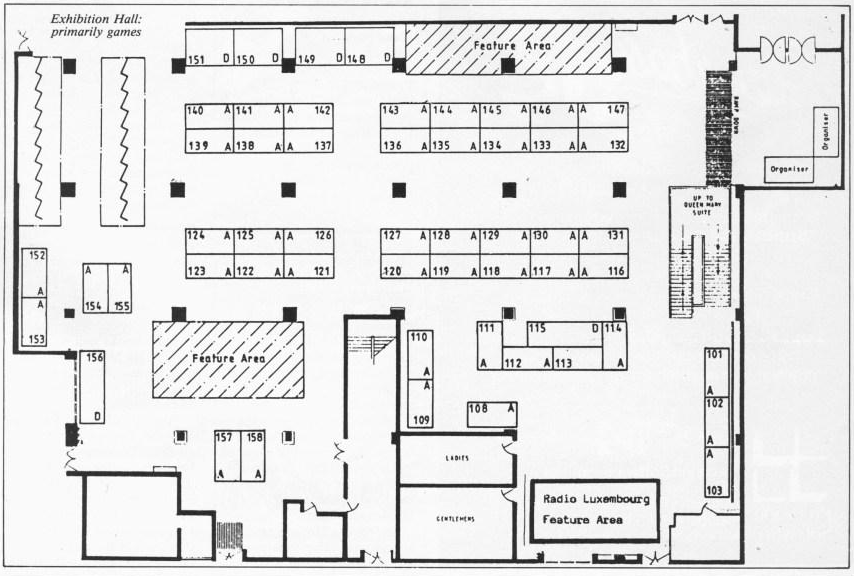
Company *Hago Products*
Stand *A140*
Address *Shripney Rd, Bognor Regis, West Sussex*
Phone *0243 863131*
"WHAT SHALL we do with the home computer" is a cry now answered by Hago Products with the introduction of its new, purpose built Personal Computer Stand. Designed to house all hardware and peripherals together in a compact, tidy and well organised stand and storage unit, its adjustable shelves make it as suitable for the 5 as for the 50 year old.

Company *Honeyfold*
Address *Standfast House, Bath Place, High St., Barnet, London*
Phone *01-441 4130*
HONEYFOLD is showing its latest titles in the Dr Watson programming series for the range of CBM machines, Basic and machine code.

Launched at this show is the Honey Aid 2 utility package which extends the CBM Basic to provide a fully structured language.

Company *ICPUG*
Address *30 Brancaster Road, Newbury Park, Ilford, Essex*
Phone *01-597 1229*
ICPUG has two stands on the main exhibition floor opposite the bar.

Visitors can join ICPUG at the stand (UK subs £10.00) and can put technical and other enquiries to the ICPUG officers present. These will



IF YOU'VE GOT ONE OF THESE -

YOU'LL NEED ONE OF THESE

Superbase 64

The complete information control system for the Commodore 64.

No matter what your business or interest, with **Superbase 64** you have a totally flexible *'record'* system, as big as you want it, as fast as you need it.

Create your own formats, enter your records, change layouts and data fields.

Superbase 64 gives you unrivalled control in home or office, business or professional practice, with an extensive range of features.

Precision Software

Superbase 64

Precision Software Limited
6, Park Terrace
Worcester Park, Surrey KT4 7JZ
Telephone: 01-330 7166
Telex: 8955021. PRECIS G

SHOW PREVIEW

include Brian Grainger (Comal), Mike Todd (64 and Vic), Mick Ryan (database and general applications), John Bickerstaff (discounts) and Jack Cohen (membership and general).

ICPUG is also conducting seminars daily in which visitors can ask questions of our panel of experts. This panel includes Jim Butterfield and those previously mentioned.

Lists of our free software library (public domain) are also available at the stand.

Company *Llamasoft*
Stand *A120*
Address *49 Mount Pleasant, Tadley, Hants*
Phone *07356 4478*

LLAMASOFT is exhibiting its usual range of quality software for the Vic 20 and Commodore 64, and also its latest 64 game, Sheep in Space, in which the player controls interstellar space sheep.

If you are not already familiar with our unique style of games design, come along to stand 120 and meet the mutant camels, space sheep and the metagalactic llamas.

Company *MC2*
Stand *B38*
Address *235 The Broadway, Wimbledon, London*
Phone *01-540 9370*

THIS year MC2, the disk storage specialist, is exhibiting the established Safer desk-top storage system. Also on display is an exciting new development in floppy disk storage, Safetrak, being launched at the show.

Company *Melbourne House*
Stand *141A*
Address *Castle Yard House, Castle Yard, Richmond, Surrey*
Phone *01 940 6064*

MELBOURNE House is exhibiting its quality range of computer books and software for both the Commodore 64 and Vic 20 computers.

Software on show for the Commodore 64 includes the best-selling adventure game of 1983, The Hobbit, together with another old favourite in the form of the popular Horace character.

Melbourne House personnel are also available to answer any questions about forthcoming products including Sherlock Holmes, Mugsy and the arcade favourite Penetrator.

Company *Merlin Software*
Stand *132*
Address *Business and Technology Centre, Bessemer Drive, Stevenage, Herts*
Phone *0438 316561*

MERLIN SOFTWARE has now established itself as a reliable software house, producing good quality games for the Commodore 64.

Come to its stand and savour the delights of such favourites as Blue Moon, Crazy Caveman, Pixie Pete, and also come to see its stunning brand new games. Be one of the first to play the traditional, skilful and enjoyable game of tennis on your 64, with the 3D sports simulation Wimbledon 64.

Company *Micro Power*
Stand *152 and 153*
Address *Northwood House, North St, Leeds*
Phone *0532 458800*

MICRO Power, market leader in games software for the BBC Micro and Electron, is now making major efforts to obtain a substantial share of the Commodore 64 software market.

Pre-launch publicity will have exceeded £20,000 by day one of the show. Micro Power regards this 5th International Commodore Show as the kick-off point for Phase 2 of its campaign — the launch of the first four titles in a range of top-quality arcade-style games.

Company *Micro-Simplex*
Address *8 Charlotte St West, Macclesfield, Cheshire*
Phone *0625 615375*

SOME OF the problems associated with obtaining account books and completing VAT returns can now be dealt with by the accounting system from Micro-Simplex.

Specially designed for small business, the system operates on basic Commodore hardware — the 8032/8250 disk drives and 4023 printer — and is menu driven. Entries via the keyboard follow a similar format to that used in the already established Simplex D system.

NOW AT LAST!

Cuthbert ON THE Commodore 64

Yes at last those fantastic top selling games for the Dragon are now available for your Commodore 64. Avoid those Marauding Moronians in "Cuthbert Goes Walkabout". Fight for survival in "Cuthbert in the Jungle" or plunder the Moronians planet in "Cuthbert in Space". These great games are a "must" for your software collection.

CASSETTE £8 EACH DISK £9.95 EACH

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Credit Card Sales
Phone 0726 3456

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0726-3456
or WEBSTERS SOFTWARE
0483 62222

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Selected Microdeal Titles available from computer dealers nationwide or from larger branches of

John Menzies Stores and Boots

commodore

Superbase

SuperBase, the complete information storage and control system, is ideal for any business, office or professional environment where records are kept... The very latest design techniques make SuperBase the last word in database technology, with all the power you need to control today's information, for tomorrow's needs! That's why SuperBase is...

The Ultimate CBM Database Manager

Key SuperBase features include fast key access, large record size, user-definable inputs, outputs, record formats... multiple screens, multiple selection criteria... word processor links, sorting, calendar, calculator... program or menu control, on-line or batch processing, transaction linking... and it's available NOW for Commodore models 700, 8096 and 64!

Superscript

A Commodore enthusiast wanted a word processor that was simple, fast, and easy to use. He wanted to handle up to 20,000 characters of text, to use a wide screen format of up to 240 characters, with full window scrolling in all directions, and be able to use the screen while printing. He wanted a word processor at a reasonable price. The enthusiast, Simon Tranmer, couldn't find one, so he wrote...

The Ultimate CBM Word Processor

SuperScript does everything he wanted... and much more. It provides a complete document preparation and storage system, making optimum use of memory and disk space. In short, it provides all the advantages of a dedicated professional word processor... And now SUPERSCRIPT II is available for Commodore models 700 and 8096, with a host of new features including arithmetic, selective sort, column move... and the 700 series version even includes a spelling-checker!

FASTEST SERVICE - LOWEST PRICES!

SUPERSCRIPT II (Commodore 700)	~~£450.00~~	£369.57
SUPERBASE (Commodore 700)	~~£450.00~~	£369.57
DTL COMPILER (Commodore 700)	~~£99.50~~	£94.78
MASTER 700 85 new commands (Commodore 700)		£295.00
COMMODORE 8096		
SUPERSCRIPT II (CBM 8096)	~~£395.00~~	£326.09
SUPERBASE (CBM 8096)	~~£450.00~~	£369.57
MEMORY UPGRADE (converts 8032 to 8096)	~~£90.00~~	£250.00
PM96 Memory Management/Toolkit etc	~~£99.50~~	£86.91
COMMODORE 2000/8000		
SUPERSCRIPT (CBM 2000/3000/4000/8000)	~~£249.00~~	£195.65
SUPERSPELL (CBM 2000/3000/4000/8000)	~~£150.00~~	£117.39
MASTER (CBM 4000/8000/8096)	~~£295.00~~	£195.65
VISICALC (CBM 2000/3000/4000/8000)	~~£175.00~~	£140.00
KRAM Keyed disk access (CBM 3000/4000/8000)	~~£99.50~~	£86.91
DTL COMPILER (CBM 2000/3000/4000/8000)	~~£99.50~~	£94.78
COMMAND-O 39 toolkit commands (CBM 4000/8000)		£50.00
COMMODORE 64		
SUPERBASE 64 database (disk)	~~£86.91~~	£76.52
VIZAWRITE 64 word-processor (disk)	~~£69.52~~	£59.13
VIZAWRITE 64 (cartridge) for tape or disk	~~£99.52~~	£65.22
VIZASPELL 64 disk dictionary/spelling checker	~~£52.13~~	£51.30
VIZAWRITE + VIZASPELL combined (disk)	~~£86.91~~	£73.91
MASTER 64 Basic IV + 85 new commands (disk).	~~£195.00~~	£100.00
DTL COMPILER 64 (disk)	~~£99.50~~	£94.78
DTL COMPILER 64 (tape)	~~£34.75~~	£32.13
TOOL 64 Toolkit/DOS Support etc. (cartridge).	~~£43.47~~	£40.83
PRACTICALC 64 Spreadsheet (disk or tape)		£38.70

PRICES SHOWN EXCLUDE 15% VAT AND ARE CORRECT ON GOING TO PRESS. ORDER BY POST OR TELEPHONE, USING CHEQUE, ACCESS, BARCLAY CARD OR OFFICIAL ORDER. DESPATCH IS BY RETURN 1ST CLASS POST, AND FREE EXCEPT FOR OVERSEAS AND CREDIT ORDERS. PRODUCT INFORMATION IS AVAILABLE ON REQUEST. [REF A26]

Calco Software

LAKESIDE HOUSE, KINGSTON HILL, SURREY KT2 7QT. TEL 01-546-7256

DUCKWORTH HOME COMPUTING

All books written by Peter Gerrard, former editor of *Commodore Computing International*, author of two top-selling adventure games for the Commodore 64, or by Kevin Bergin. Both are regular contributors to *Personal Computer News, Which Micro?* and *Software Review*.

SPRITES & SOUND ON THE COMMODORE 64
by Peter Gerrard

A complete guide to using the extraordinary features of the Commodore 64, together with a full working explanation of the chips that make it possible: the 6581 Sound Interface Device and the 6566 Video Interface Chip, together with the processor that makes it all tick, the 6510.

Sections on programming your own musical instruments, producing sprite and programmable character animation, make this the guide for users of the Commodore 64 who want to get the most from the special features of their computer.

£6.95

COMMODORE 64 GAMES by Kevin Bergin

This is a collection of 21 exciting programs specially written for the Commodore 64, including Golf, Snake, Air Attack, Draughts, Car Dodge, Tank Battle, and Minefield. An adventure game is also included as well as a program to enable you to devise your own version of Basic by re-defining keywords. Each program is accompanied by notes on its structure to enable you to modify or extend it.

£6.95

Other titles in the series include *Using the 64, 12 Simple Electronic Projects for the VIC, Will You Still Love Me When I'm 64, Advanced Basic & Machine Code Programming on the VIC* and *Advanced Basic & Machine Code Programming on the 64.*

Write in for a descriptive leaflet (with details of cassettes).

DUCKWORTH
The Old Piano Factory, 43 Gloucester Crescent, London NW1 7DY
Tel: 01-485 3484

Superbase 64

TRANSFORMS THE COMMODORE 64 INTO A FULL-FEATURED AND PROFESSIONAL DATABASE SYSTEM! WITH UP TO 1000 CHARACTERS PER RECORD ON UP TO 4 SCREENS... AND UP TO 128 ITEMS PER RECORD, DEFINABLE AS KEY, TEXT, NUMERIC, CONSTANT, RESULT OR DATE... IN FILES OF UP TO 16M CHARACTERS! SUPERBASE 64 EVEN HAS SPREADSHEET AND CALCULATOR CAPABILITY, CALENDAR FUNCTIONS, EASY INPUT FROM WORDPROCESSOR/DATA FILES, BOTH MENU-DRIVEN AND PROGRAM OPTIONS; SORTING/SEARCHING, FULLY DEFINABLE OUTPUTS... SUPERBASE 64 IS ESSENTIAL IF YOU WANT THE MOST FROM YOUR 64! SUPPLIED ON CBM 1541 DISK WITH EXCELLENT TUTORIAL/REFERENCE MANUAL. OUR PRICE ~~£99.95~~ £88.00!

VIZAWRITE 64

VIZAWRITE 64 IS A HIGH-PERFORMANCE, LOW-COST WORD PROCESSOR, WITH ON-SCREEN FORMATTING, THAT TAKES FULL ADVANTAGE OF THE 64'S COLOUR, GRAPHICS AND MEMORY FEATURES... AND SUPPORTS VIRTUALLY ANY PRINTER! WITH A COMPREHENSIVE AND EASY-TO-FOLLOW USER MANUAL. VIZAWRITE IS THE ULTIMATE PERSONAL COMPUTER WORD PROCESSOR! AVAILABLE ON CARTRIDGE (~~£89.95~~ £75!), DISK (~~£79.95~~ £68!) OR WITH VIZASPELL (~~£99.95~~ £85!)

Master 64

MASTER 64 IS A TOTALLY NEW CONCEPT... A COMPLETE PROGRAM DEVELOPMENT PACKAGE, THAT'S AVAILABLE NOW FOR THE COM 64. MASTER HAS 85 NEW COMMANDS... AND BASIC IV TOO! PLUS PROGRAMMER'S TOOLKIT; MACHINE CODE MONITOR; BUSINESS BASIC, KEYED DISK ACCESS, MULTIPLE SCREENS, USER-DEFINABLE INPUT ZONES, REPORT GENERATOR, 22-PLACE ARITHMETIC, DISK DATA COMPRESSION, DATE CONTROL, SCREEN PLOT, SCREEN DUMP, AND MORE... EVERYTHING YOU NEED TO PROGRAM YOUR 64 TO TOP PROFESSIONAL STANDARDS! (~~£149.95~~ £115!)

*** WANT IT TOMORROW? *** CALL US TODAY! *** ON 01-546-7256

VIZASPELL (DISK)	~~£59.95~~	£49.95	DTL COMPILER 64 (DISK)	~~£149.95~~	£109.00
EASYSCRIPT (DISK)	~~£75.00~~	£69.00	SUPERBASE (CBM 700)	~~£495.00~~	£475.00
EASYSPELL (DISK)	~~£50.00~~	£48.00	SUPERSCRIPT (CBM 700)	~~£495.00~~	£425.00
SIMON'S BASIC (CARTRIDGE)	~~£50.00~~	£48.00	SUPERSPRITE (8096/8296)	~~£495.00~~	£450.00
ASSEMBLER 64 (DISK)	~~£26.95~~	£23.00	SUPERBASE (8096/8296)	~~£495.00~~	£375.00
TOOL 64 (CARTRIDGE)	~~£49.95~~	£46.95	SUPERSCRIPT (8096/8296)	~~£495.00~~	£375.00
PRACTICALC (DISK/TAPE)	~~£44.95~~	£41.50	SUPERSCRIPT (3000-8000)	~~£295.00~~	£225.00
MULTIPLAN (DISK)	~~£99.95~~	£75.00	MASTER (4000-8296)	~~£195.00~~	£159.00

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Calco Software

LAKESIDE HOUSE, KINGSTON HILL, SURREY, KT2 7QT. TEL 01-546-7256

Company *Mills Associates*
Stand *B48*
Address *Wonastow Rd, Monmouth, Gwent*
Phone *0600 4611*
MILLS Associates is Commodore's approved supplier of maintenance services for business system computers, and provides a comprehensive range of services nationally through a network of registered centres.

Company *Mirrorsoft*
Stand *115*
Address *Holborn Circus, London EC1*
Phone *01-822 3947*
MIRRORSOFT is the newly-formed home computer software division of Mirror Group Newspapers, publishers of the *Daily Mirror, Sunday Mirror* and *Sunday People.*

Launched in November 1983, Mirrorsoft publishes a number of well reviewed Commodore 64 programs, including Caesar the Cat.

At the show Mirrorsoft will be featuring CBM 64 early-learning games: First Steps with the Mr Men, Quick Thinking! and two new early-learning releases, Count with Oliver and Look Sharp!

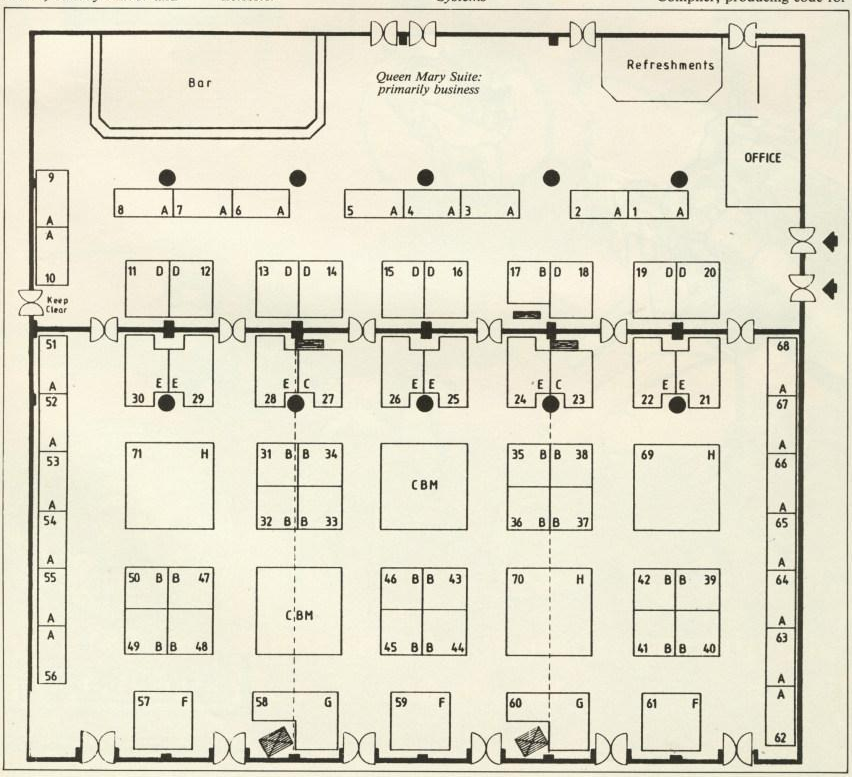
The major new Mirrorsoft product at the show is Go-Sprite, a versatile easy to use Sprite Editor for the CBM 64 which is icon driven and controlled by joystick.

Company *Brian O'Hara & Associates*
Stand *34*
Address *38 Millstone Lane, Leicester*
Phone *0533 536753*
THE COMPANY is distributing details of the various training modules which it offers and which can be assembled in many combinations to provide tailored sales training courses.

The majority of dealer salesmen have had little or no sales training which means that a large proportion of dealers' marketing costs are totally wasted.

The courses which have been run so far have produced an extremely enthusiastic response from dealers who are experiencing higher turnover and greater profitablility as a result of the courses.

Company *Oxford Computer Systems*
Stand *E21*
Address *Hensington Rd, Woodstock, Oxford*
Phone *0993 812700*
OXFORD Computer Systems is exhibiting the following products at the show:
Petspeed for the 4000/8000 series Pets.
The Integer Basic Compiler for the 4000/8000 Pets.
Portspeed — a cross-compiling version of Petspeed, producing code for the Commodore 64.
X-64 — a cross-compiling version of the Integer Basic Compiler, producing code for the Commodore 64.
B-Port — a cross-compiling version of Petspeed, producing code for the 700's.
X-700 — a cross-compiling version of the Integer Basic Compiler, producing code for



THE HOTTEST GAMES IN TOWN FROM LLAMASOFT

HELL GATE

HELL GATE on the 64 is certainly no REVENGE or HOVER BOVVER, being the VIC 20 code tweaked to run on this system. However we are offering it at a bargain price to those who like an unusual shoot-'em-up, fans of Gridrunner and Matrix should enjoy themselves and the game is challenging to all.
Available for Commmodore 64 **£5.00** and VIC-20 **£6.**

LASER ZONE

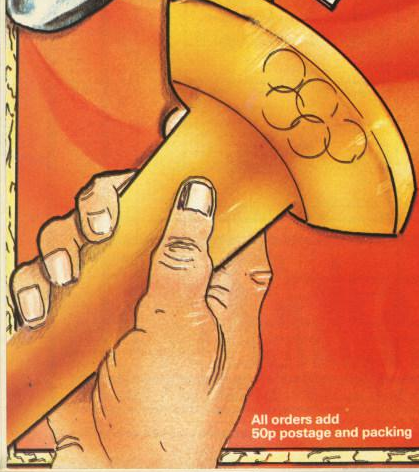
Experience Laser Zone – an utterly NEW totally ORIGINAL masterpiece of Video games design. Learn to control two spaceships at once. Feel the EXHILARATION as, after long hours of practice, you control the two ships so that they function as a smooth, co-operative team! Feel the raw POWER as you lunge for the electro button and BLAST your enemies into expanding clouds of SPACE JUNK!! Feel the humiliation as a carelessly aimed BLAST slams into the side of your last remaining ship!! 8K expansion required.
Available for Commodore 64 **£7.50** and VIC-20 **£6.**

METAGALACTIC LLAMAS BATTLE AT THE EDGE OF TIME

A fast and original game for the unexpanded VIC. Challenging and colourful, with good sonics and a unique game action and design, this promises to be the most exciting new 3.5K VIC game since the introduction of GRIDRUNNER nearly a year ago.
£5.50

GRIDRUNNER

Finally true arcade quality on the unexpanded VIC! Shoot down the segmented DROIDS invading the grid. Beware of the pods and zappers! The awesome speed, sound, and graphics gives you the best blast available for unexpanded VIC. Available for VIC-20 **£5.00** Commodore 64 **£5.00** Atari 400/800 **£7.50**



REVENGE OF THE MUTANT CAMELS

At last the long awaited sequel to Attack of the Mutant Camels is available. You are controlling a ninety foot high, neutronium shielded laser spitting death camel, leading a rebellion against your evil Zzyaxian overlords. The game features beautiful smooth scrolling graphics and no less than 42 different attack waves, more than any game in video history. The challenge of play will last for months as you battle to see what's on the next wave.
£7.50

MATRIX

Jeff Minter has taken Gridrunner – the game that topped bestseller charts in USA and UK – and created an awesome sequel.
Graphically superb, it features multiple screens, new aliens and attack waves, mystery bonuses, renegade humanoids, deflexor fields, diagonal tracking countdown/panic phase and much, much more ...
Packed into 20 mind-zapping zones and accompanied by incredible sonics.
8K expansion rquired.
Available for Commmodore 64 **£7.50** and VIC-20 **£6.**

ATTACK of the MUTANT CAMELS

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Company *Precision Software*
Stand *142 and 69*
Address *6 Park Terrace, Worcester Park, Surrey*
Phone *01 330 7166*
SUPERBASE 64 is the complete information control system for the Commodore 64. Superbase 64 is a serious software product with endless uses wherever a requirement to store, index, retrieve and report on lists of information arises — be it in the home or business.

Company *Quick-Count*
Stand *A68*
Address *15 Neeld Crescent, London NW4*
Phone *01 202 5486*
QUICK-COUNT'S much acclaimed Cash Trader's Bookkeeping System for the CBM 64 is its main exhibit.
Quick-Count is also demonstrating a Leasehold Property Receivables program on the CBM 64.

Company *Quicksilva*
Stand *156*
Address *Palmerston Park House, 13 Palmerston Road, Southampton, Hants*
Phone *0703 20169*
MILLENIA have passed and near the end of another Age emerges Quicksilva. The evolution started in the primeval oceans when Quicksilva existed as a school of dreaming fish, now Quicksilva exists in a different form.
In these technological days lives an electronic creature which stands out amongst its fellows, this is the Commodore 64, an animal legendary for the way in which it devours information and plays the most extraordinary games.
Now the Quicksilva and Commodore play games together, amazing games, games to make the hairs stand out on the back of your neck in admiration. If you wish to be thrilled by action which surely could only have come from outside the solar system then visit Quicksilva's remarkable stand.

Company *Radio Luxembourg*
Address *38 Hertford Street, London W1*
Phone *01-493 5961*
THE RADIO station is having its own live stage show at the show. Luxembourg DJs Dave Eastwood and Mike Wallis are in attendance.
The stand also features personality girls, music, competitions and games.

Company *Romik*
Stand *154 and 155*
Address *272 Argyll Avenue, Slough*
Phone *(0753) 71535*
ROMIK is exhibiting its full range of Vic 20 and CBM 64 games software.

Company *Saxon Computing*
Stand *A1*
Address *3 St Catherine's Drive, Leconsfield, Beverley, North Humberside*
Phone *0401 50697*
SAXON Computing is exhibiting its new Figaro 64 numeric database system for the first time at the show.

Company *Software For All*
Stand *A67*
Address *72 North St, Romford, Essex*
Phone *0708 60725*
SOFTWARE For All moved out of games software early in 1983, seeing the need for serious business software on the home market front.
The range since then has been expanded and at present consists of Stock Control, Invoicing Sales and Purchase Ledger available on both cassette and disk systems.

Company *Stack Computer Services*
Stand *A109/A110*
Address *290-298 Derby Rd, Bootle, Merseyside*
Phone *051 933 5511*
COMPUTER accessory leader Stack is displaying its range of popular products for the Vic 20 and CBM 64, including lightpens, drawing software, games, interfaces, utilities and the Stack Light Rifle.

Company *Stonechip*
Address *Brook Trading Estate, Deadbrook Lane, Aldershot, Hants*
Phone *0252 318260*
ON display are its full range of products for the Vic 20 and Commodore 64, including the successful Vixen 16K Switchable RAM, the Vixen Switchable Motherboard, and the Programmers Aid ROM and Cartridge, which give the Vic 20 19 superb new commands.

Company *Sunshine*
Stand *20*
Address *12/13 Little Newport St, London WC2*
Phone *01 437 4343*
THERE IS a special £1 show discount on the latest Sunshine Commodore 64 book titles, and special subscription offers.
Back issues of *Commodore Horizons* are available from the stand. Staff from the magazine will be there to answer any questions you may have about the magazine or its contents.

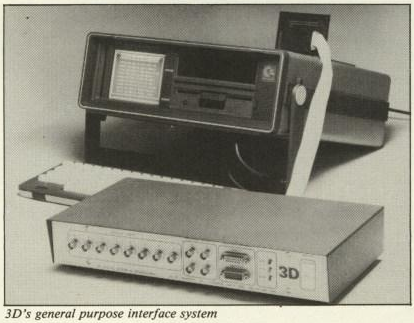
Company *Supersoft*
Stand *D18 and A143*
Address *Winchester House, Canning Rd, Wealdstone, Harrow, Middx*
Phone *01 861 1166*
THE upstairs stand is showing Pet and 64 business programs, with downstairs devoted to games.

Company *3D Digital Design*
Stand *66*
Address *18/19 Warren Street, London W1*
Phone *01-387 7388*
3D DIGITAL Design & Development, the renowned specialist in the field of microcomputer interfacing, is exhibiting working demonstrations of a number of its interface products.

Company *Tirith*
Stand *B33*
Address *Pear Tree House, Woughton on the Green, Milton Keynes*
Phone *0908 679528*
ON DISPLAY are the Crompton Personal Computer Desk, the Crompton Workstation and The Crompton Printer Stand.

Company *Viza Software*
Stand *A135/136*
Address *9 Mansion Row, Brompton, Gillingham, Kent*
Phone *0643 813780*
VIZA Software are showing Viza Write, VizaSpell and the exciting new product VizaStar.

Company *Vulcan Electronics*
Address *200 Brent St, London NW4*
Phone *01 203 6366*
VULCAN Electronics is the country's leading distributor of home computer peripherals such as joysticks and interfaces.



3D's general purpose interface system

EVERY effort has been made to ensure that the information in this show preview is accurate, but plans may have changed between preparation of the preview and the show itself. Our thanks go to the exhibitors who provide information — apologies to those we've missed.

The preview was compiled by Commodore Horizons, 12-13 Little Newport St, London WC2R 3LD (telephone 01-437 4343).
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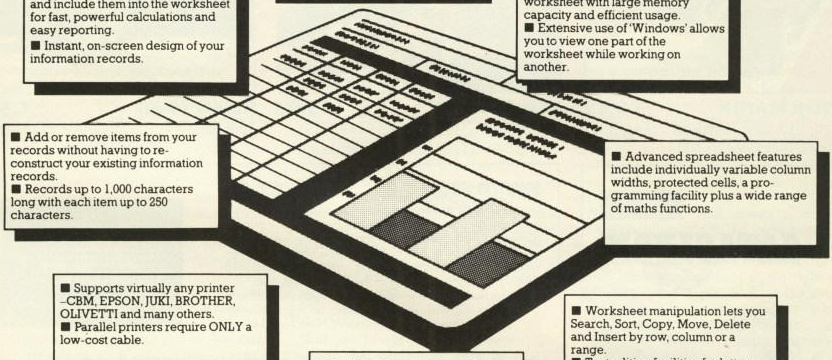

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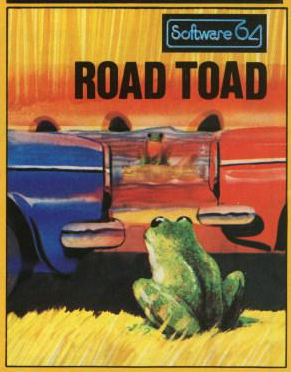

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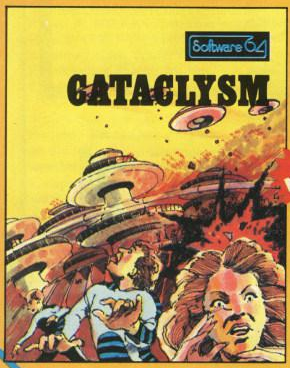

NEW

WORD FEUD **£7.95**

This brilliantly conceived program combines the best parts of arcade games with the best of educational games, making a real family game that anyone who can see the screen can participate in. You have to find the word that is hidden twice in the jumble of letters, then guide your sights over one of the occurrences of it.

The first to find it wins! You can play by yourself or in teams against the computer, or against other players. Three difficulty levels are included to suit young and old alike!

BONZO 64 **£7.95**

This best-selling game for the VIC-20 is now available on the 64! Featuring the most intelligent and devious monsters you have ever tried to avoid, the Bonzos, this game is a real joystick wrencher. Move Hans, the handyman, up and down the ladders to pick up the boxes from the different levels.

But don't meet a Bonzo on the way!

NEW

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Pure shoot-em-up arcade action for the 64 and unexpanded VIC! The Lunar city of Erriam is under attack from the ships of the Jovian empire. Their merciless bombing will reduce your city to a pile of rubble, unless you can hold them off. You are the commander of the sole laser defence base. Your mission - hold out for as long as possible.

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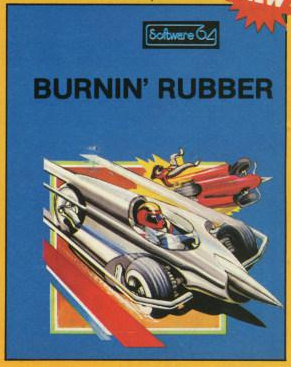
You are an entrant in the great Intergalactic Four Seasons Death Race!. You must tackle the Spring, Summer, Autumn and Winter sections with the objective of running as many other cars as possible off the road. The opposition is numerous, including the indestructable but slow Tank Cars, the tricky Deathmobiles and many other Demon Drivers. You have one advantage - your car can fly for a limited distance, allowing you to avoid hazards if you're quick enough! All this and more makes Burnin' Rubber the car race of the century!



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Getting round the problems of maths in machine code

*Mathematical calculations of any real complexity present great problems in machine code programs. **J R Goodenough** explains the principles of floating point arithmetic, and how ROM subroutines can help you out.*

IF YOU HAVE ever written programs in machine code, you will know how much faster such programs run compared with the equivalent written in Basic. However, you will also be aware of the drawbacks, especially if you need to do calculations which are more involved than adding and subtracting simple numbers. Even a simple task such as calculating the area of a circle is an enormous problem. But how easy it is to write A = π×R×R in Basic! (If you are wondering why I didn't say A = π×R↑2, you should read an article on how to make your Basic programs run faster!).

For all but the simplest calculations, most computers use a method known as floating point arithmetic, and the Commodore 64 is no exception. (in fact, Commodore's Basic goes rather overboard in this respect: even a simple integer addition such as A%=A%+1 is done in floating point, by converting the integer to floating point, then converting back again after the addition).

Larger computers have special hardware to deal with floating point, but most micros perform these calculations using subroutines. In the Commodore 64, these subroutines are held in the Basic ROM, although some parts spill over into the monitor ROM. All we need to know is where the subroutines are, and how to call them, and there is nothing to stop us using them in our machine code programs.

Before I go into details of how to use these routines, it is helpful to understand what floating point arithmetic is, and why it is necessary. Experts can skip this bit.

Integer arithmetic can only deal with whole numbers, so we hit problems trying to calculate the area of our circle. As long as the radius, R, is a whole number we can calculate R×R without too much difficulty, but how do we deal with π (3.14159. . .)? This is where floating point comes in. In a Basic program we can write π (the long way, without pressing shift–up-arrow!) as 3.14159 or as 0.314159E1, or even as 314.159E-2. The "E" part is called the Exponent, and means "times 10 to the power of". Whichever way we choose to write the number, it is always stored in the computer in the same way.

Assuming for a moment that the computer worked in decimal (which it doesn't of course — it makes explaining things easier), then it would choose an exponent which would make the rest of the number a fraction which is less than one, but without any extra zeroes to the right of the decimal point. So 64.0 would be stored as 0.64E2, 0.0001 as 0.1E-3 and π as 0.314159E1. That's why it's called "floating point" — the decimal point floats up or down to make this fraction (called the "mantissa"), and the exponent is adjusted to suit.

Binary

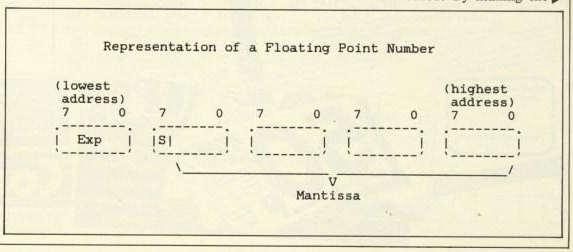
Now we haven't got this far without knowing that computers work in binary, not decimal. The principle is the same, but instead of a decimal point a floating point number has a binary point, and an exponent which means "times 2 to the power of" instead of "times 10 to the power of". Binary fractions seem a bit peculiar at first, as we are so used to the decimal system. But it's really quite simple. In the same way as in decimal 0.1 means a tenth and 0.01 means a hundredth, so in binary 0.1 means a half and 0.01 means a quarter. (Purists would say "denary" instead of "decimal", but I'll go on using the term I've used all my life, unless the editor says differently!)

So the binary number 1101.1, which is 13½ in decimal, is stored as 0.11011 (that's the mantissa) with an exponent value of 4. Commodore 64 Basic used 5 bytes to store a number, the first byte holding the exponent, and the other 4 bytes, or 32 bits, the mantissa. Note that the number of bits, or "binary places", in the mantissa only affects the accuracy to which we can hold the number, not the size : 47.63 (decimal example again!) is the same size as 47.630000, but is less accurate.

Now for some final points to round off the complicated bit. To allow negative numbers, we need to find a spare bit in which to store the sign. A clever trick here : since the bit immediately to the right of the binary point is always a '1' (no extra zeroes, remember, and the only other value in binary is '1'), this bit does not actually need to be stored in the number — instead it is used to hold the sign. A '0' in this position means positive, and a '1' means negative. When the floating point subroutines process a number, the sign bit is pulled out and stored in a separate location, and the missing '1' is put back so that the arithmetic works properly. Unlike integer numbers, negative floating point numbers are not stored in two's complement form — just the sign bit is changed.

Another point to note is that the exponent has 128 added to it, so that the value of the exponent byte in our 13½ example is really 128+4, or 132. The only reason for this is that it makes things easier for the floating point routines.

Finally, a way of representing the number zero is needed. By making the ▶



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◀exponent smaller and smaller, we make the number smaller and smaller, but we can't actually get to zero, because of the bit hidden by the sign. So by convention, the number zero is represented by an exponent value of zero. The mantissa bytes are also usually zero, but this doesn't make any difference to the value.

Routines

Now for a description of the routines themselves. Obviously, if you bank out the Basic ROM you won't be able to access them, so if you normally use the 8K section of RAM from $A000 to $BFFF in machine code programs you'll have to be careful.

All the floating point routines make use of the Floating Point Accumulator (FAC). This is held in the six bytes located between $61 and $66 in the zero page. The FAC holds numbers in a similar format to the floating point variables we've been talking about up till now, except that the sign is removed from the first byte of the mantissa ($62) and stored in a byte on its own (FACSGN — $66).

Fortunately, we don't have to worry about this internal format. The only locations in the FAC that will concern us further are the exponent (FACEXP — $61), used to check for a zero result, and FACSGN, used to check the sign.

Some of the floating point routines (like square root and cosine) just do their thing on the existing contents of the FAC, and leave the result in the FAC. Others (like multipy) work with two numbers. In this case, one of them is the number already in the FAC, and the other is a variable (or constant) held in memory in the standard 5-byte format. With one exception, this is referenced by loading the A-register with the low byte of the address and the Y-register with the high byte. I'll refer to this as (A,Y) addressing from now on. So the instructions

```
LDA#<XYZ
LDY#>XYZ
JSR FMUL
```

will multiply the existing contents of the FAC by the contents of the variable stored at address XYZ, and leave the result in the FAC. If we want to take the square root of the result, an additional

```
JSR SQR
```

is all that is needed. Of course, at the beginning of the assembly, we have to define the symbols FMUL and SQR as the ROM addresses of these routines. These addresses, and their calling sequences, are given in the table.

Radius

Up till now I have not shown how to get numbers (variables, constants) in and out of the FAC. There are two routines which I call FLD and FSTO which do this. FLD loads the FAC with the variable at (A,Y), while FSTO stores the contents of the FAC in the location addressed by (X,Y). Note that the low address byte must be loaded into X, not A. This is the one exception I mentioned earlier.

Now we have enough information to write that program to work out the area of a circle, as in our first example. Let's assume the 5-byte floating point variable RADIUS contains just that, the constant π is in a location called PI, and we want to store the result in the variable AREA. The program is simply:

```
LDA#<RADIUS ; Load radius to FAC
LDY#>RADIUS
JSR FLD
LDA#<RADIUS ; square it
LDY#>RADIUS
JSR FMUL
LDA#<PI ; multiply by
LDY#>PI
JSR FMUL
LDX#<AREA ; store result
LDY#>AREA
JSR FSTO
```

Now consider what happens if we write

```
LDA#<ABC
LDY#>ABC
JSR FLD ; load
LDA#<DEF
LDY#>DEF
JSR FSUB ; subtract
LDX#<GHI
LDY#>GHI
JSR FSTO ; store result
```

We get the result of ABC-DEF stored in GHI, right? Wrong! A peculiarity of the floating point subroutines FSUB (subtract) and FDIV (divide) is that they work the opposite way round to that which you would expect. What we really calculated in the last example was DEF-ABC. This is one to watch, though it doesn't really cause problems. Of course with addition and multiplication it doesn't matter which way round we do it.

If you want to check the result of a floating point operation, for example to do a branch on zero, then you have to do an LDA FACEXP first — the routines do not set the condition codes. Similarly a BIT FACEXP will act to check the sign of the result.

Two routines are available to convert a signed (two's complement) integer to floating point and vice versa. By loading the high-order byte of an integer into A and the low order byte into Y, and calling the routine FLOAT, the integer is converted to floating point in the FAC, overwriting the previous FAC contents.

Calling the routine INT converts the number in the FAC to an integer, with the high-order byte stored in A and the low-order byte in Y. Note that INT destroys the contents of the FAC, and that the number must be within range for an integer (i.e. between —32768 and +32767) or a conversion error will be given.

There are two routines to convert between floating point and ASCII characters. These are useful for input and output.

Convert

Finally, if you want to include floating point constants in your assembly language program, the following Basic program lets you type in a number and then prints out the five bytes it is stored as. Some useful constants are already available in the ROM — these are included in the table.

```
10 X=0:REM THIS MUST BE THE
VERY FIRST STATEMENT
20 XA%=PEEK(45)+256*PEEK(46)+2
30 INPUT "NUMBER";X
40 FOR I=0 To 4:PRINT
PEEK(XA%+I);:NEXT
50 GOTO 30
```

■

Table of Floating Point ROM Routines

Name	*Address*	*Operation*	*Description*
FLD	$BBA2	FAC = (A,Y)	Floating load
FSTO	$BBD4	(A,Y) = FAC	Floating store
FADD	$B867	FAC = (A,Y)+FAC	Floating add
FSUB	$B850	FAC = (A,Y)−FAC	Floating subtract
FMUL	$BA28	FAC = (A,Y)*FAC	Floating multiply
FDIV	$BB0F	FAC = (A,Y)/FAC	Floating divide
FLOAT	$B391	FAC = FLOAT(Y,A)	Integer to floating point (note: A = high order integer, Y = low order integer, NOT an address!)
INT	$B1AA	Y,A = INT(FAC)	Floating point to integer (FAC destroyed, notes as FLOAT)
SQR	$BF71	FAC = SQR(FAC)	Square root
EXP	$BFED	FAC = EXP(FAC)	e to the power of
LOG	$B9EA	FAC = LOG(FAC)	Natural logarithm
ATN	$E30E	FAC = ATN(FAC)	Arctangent (result in radians)
COS	$E264	FAC = COS(FAC)	Cosine (argument in radians)
SIN	$E26B	FAC = SIN(FAC)	Sine (argument in radians)
TAN	$E2B4	FAC = TAN(FAC)	Tangent (argument in radians)
FLSTR	$BDDD	Convert value in FAC to ASCII string in $0100-$0101A, terminated with zero byte.	
STRFL	$B7B5	Convert ASCII string to value in FAC. A = length of string ($22,$23) = address of string.	

Some useful ROM constants

$AEA8	pi
$E2E0	pi/2
$E2E5	2*pi
$B9DB	SQR(2)
$B9D6	SQR(2)/2
$B9BC	1.0
$E2EA	0.25
$BF11	0.5

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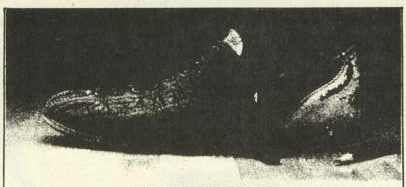

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Turtle and Logo team up

***Anthony Ginn** tests Valiant's turtle with CBM's Logo*

THERE ARE AROUND 2½ million computers in British homes. We've more micros per head of the population than any other country in the world. Most people bought their micro eager to learn programming, but now spend their time playing computer games. What happened to that initial enthusiasm? The answer is simple. It was destroyed by Basic.

Basic was created in the 1960s when computer power was expensive. It was designed to use very little memory. Unfortunately "easy for the computer" doesn't mean "easy for the user", as anyone who has tried to learn it will tell you. The complex mathematical syntaxes involved in Basic programming are damaging to mental health. It appeals only to the mathematically inclined, and Basic's difficulties are accepted as being the difficulties of computer programming.

Basically

Because Basic only used a small amount of memory it appeared on the first micros. Over the years computers have become much cheaper. The computing power of a Commodore 64 would have cost hundreds of thousands of pounds 10 years ago, and millions of pounds 20 years ago. The original rationale behind Basic is no longer valid, yet we seem to be stuck with it. Most micros have it hard-wired into them and programmers are used to it.

Basic is often compared to the QWERTY keyboard. It would seem logical to put the keys that are used most on a typewriter in the centre of the keyboard, they seem scattered at random. This is because on the first typewriters, keys that followed each other often jammed. To prevent this happening the most frequently used keys were separated. The technology soon advanced to render this layout obsolete, but by then typists were used to QWERTY and it was being taught to secretaries. So we got stuck with it, just as we seem to be stuck with Basic.

At the Massachusetts Institute of Technology, 15 years ago, a team working with Seymour Papert, educationalist and computer scientist, was taking a different approach to programming. They worked on the largest mainframes available to create a language that was powerful and yet easy to learn. They came up with Logo.

The recent availability of computer power has seen Logo move from the mainframe into the homes. Full implementation of the language are available for several popular micros, including the Commodore 64 which has one of the best from Commodore itself. Several "pseudo Logos", which are versions of Turtle Graphics, and not the full language, have also appeared. Where there is a full versions of Logo available these should be avoided.

Logo has powerful accessible graphics capabilities, handles words and lists, performs mathematical functions, and creates music. Because it is so easy to get started, it is becoming standard in primary schools.

Children are introduced to Logo with a little cybernetic creature called the "turtle" — a motorised robot. It is controlled from the keyboard using Logo. If you lift it up to discover its sex all you'll find is a felt tip pen embedded in its belly. This can be raised or lowered by the commands PENUP and PENDOWN. The turtle is moved forwards by the command FORWARD followed by a number to tell it how far to go, and back with BACK and a number. RT and a number turns the turtle that number of degrees to the right and LT and a number turn it to the left. These commands are usually abbreviated to PU, PD, FD, BK, RT, and LT. Different versions of Logo have slight variations.

FD 100 sends the turtle forwards 100 units, RT 120 turns it 120 degrees to the right. FD 100, RT 120, FD 100, RT 120, FD 100 and RT 120 draw a triangle. It could be written more simply as: REPEAT 3 [FD 100 RT 120].

The turtle could be taught to draw a triangle by typing:

```
TO TRIANGLE
REPEAT 3 [FD 100 RT 120]
END
```

Whenever TRIANGLE is typed the turtle will draw a triangle side 100 units. TRIANGLE could then be used in another procedure called WHEEL.

```
TO WHEEL
REPEAT 36 [TRIANGLE RT 10]
END
```

Two WHEELS could then be used in a procedure called BICYCLE, along with SEAT, FRAME and PEDALS.

The first turtle appeared at MIT around 1970 and has been used to teach Logo to four year olds and Pascal to undergraduates. The first British turtle was the Edinburgh turtle. This is wired to the ▶

◀computer and power source by an umbilical cord and powered by two linear DC motors. A magnetic device monitors the angular movement of the wheels as they turn. It is a descendent of a Meccano turtle made by the artificial intelligence unit of Edinburgh Univeristy. The Meccano turtle was controlled by a mainframe computer and was not very accurate. It was redesigned along the lines of the present day Edinburgh turtle.

Valiant

This month sees the launch of a new generation of turtles, the Valiant turtle. The Valiant turtle has come of age and severed the "umbilical" connection with "mother computer". It is remote-controlled. A compact little infra-red communicator which plugs into the computer sends instructions to the turtle. The communicator has a range of 8 metres and only needs to point roughly in the direction of the turtle. The absence of a cord dragging behind the turtle gives it great freedom of movement and means that the draws are of very high accuracy.

The turtle is very attractive to look at. A great deal of thought has gone into the design. It has a clear green perspex geodesic shell. Two red eyes light up to indicate when the power is on.

It is powered by an on board stack of rechargeable nickel cadmium batteries. A battery charger is supplied with the turtle. It recharges overnight but has an "emergency" fast charge mode which will give the turtle enough power to run for half an hour with only 15 minutes charging. A jack-plug from the charger fits neatly into a socket behind one of the wheels. When the batteries need recharging the turtle's eyes go out.

The pen used in the turtle is a standard Berol felt tip, found on the floor of any primary classroom in the country. The pen can be changed without removing the shell of the turtle, by simply pulling the old one out and pushing a new one in.

When you type FD 100 the Valiant turtle moves forwards 100cm. This gives it great potential for use in measurement. It can be reprogrammed to move in units of 1mm, 1 metre or even an inch. It turns in degrees, but can be reprogrammed to turn in radians. It is also capable of drawing smooth arcs and circles.

The documentation with the turtle promises to be very good. There will be a technical manual with instructions on how to set up and run the hardware and software, and Valiant is considering publishing a "features magazine" containing articles for teachers, parents and children. There will be games and activities for school and home, and articles explaining about Logo, along with stories, puzzles and competitions. Valiant hopes to put out the features magazine every three months. It's nice to see something being done for children in the documentation. Logo is designed for children, yet every manual I've seen has been written for adults.

The turtle sells for around £200, with a £50 discount for schools. It seems expensive, but the price and quality of the competition make it a bargain for turtle lovers. For the price you get the turtle, communicator and machine dependent interface cable, battery charger and batteries, voltage adaptors, pen, technical manual and features magazine, and machine dependent software. If there is not a version of Logo currently available for your micro, for instance if you have a Vic 20, then Valiant will be able to supply a software version of the Basic program Turtle Graphics.

Connect

Once I'd found my way around the hardware I'found the turtle easy to set up and run. The only thing to connect is the communicator, which fits into a port in the back of the computer. Logo is loaded in the normal way, and then an interface disk is loaded. This tells you when to switch on the turtle and the communicator and away you go.

My main problem was finding enough large sheets of paper for the turtle to draw on. Valient should consider marketing a "wipe clean" plastic sheet for the turtle to draw on.

Watching the turtle with its glowing red eyes move silently across our living room carpet, programmed by my six year old son, I felt that the age of the robot was dawning at last. My children are growing up with computer programmable robots like I grew up with Dinky toys. ■

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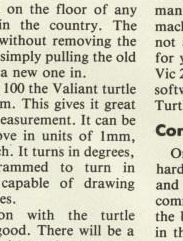

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Sprites

Mark Frost from Nottingham sends this program for the Commodore 64

THIS UTILITY makes sprite design easy and takes the time out of calculating data statements. Sprites can be defined in normal or multicolour mode, with a grid 24×21 in normal mode or 12×21 in multicolour mode.

To design a sprite, enter Draw mode by pressing Z and use the cursor keys. To erase press X. The points you have plotted appear in the appropriate colour. In multi-colour mode, change colours using A, S and D.

When you have finished designing, press the leftwards arrow key and the data will be calculated. The menu will then allow you to list the data and end, display the sprite, or change the design. You can then incorporate the design in your programs.

```
1 REM**[SPRITE]***@ MARK FROST 1984**
5 DIMA%(70):POKE53280,0:POKE53281,0
6 DIMY(510)
10 PRINT"■"TAB(8)"■■SPRITE DESIGNER [M.F]  ■■"
20 PRINTSPC(8)"■■CURSOR CONTROLS MOVE ■■J ■"
30 PRINTSPC(8)"■■Z=DRAW MODE■"
40 PRINTSPC(8)"X=NON DRAW MODE■"
50 PRINTSPC(8)"A.S.D.MULTICOLOUR KEYS■"
55 PRINTSPC(8)"←=CALCULATES DATA■■■■■"
60 INPUT"     ■■NORMAL OR MULTICOLOUR A/B";F$
70 IFF$="A"THENC$="└──────────────────────┘":S=1:M=40:B=1:GOTO80
75 B=3
80 FORA=1TOB
90 INPUT"■■           COLOUR 1-15";C(A)
100 IFC(A)<0ORC(A)>15THEN90
105 NEXT
110 IFF$="B"THENC$="└──────────────┘":S=2:DIMCL(270)
112 PRINT"■"
115 FORA=1TO21
116 PRINTSPC(6)"■"C$:NEXTA
200 Q=8:Z=55343:X=1071:Y=160:D=76:P=1069:L=-1:J=76:H=76:I=63:SM=53248
210 PRINT"■■       SERIES1/■SERIES2/■SERIES3"
255 PRINT"■"TAB(33)"■■■■Z=DRAW■■■"
256 PRINTTAB(33)"■■X=ERASE■■■■"
257 PRINTTAB(33)"← DATA■■■■■"
260 IFF$="B"THENI=122
270 IFPEEK(X+M)=32THEN311
275 IFPEEK(X+M)=101THEN311
280 IF(X+M)<1070OR(X+M)>1900THEN311
300 POKEX,D:X=X+M:Z=Z+M:POKEX,Y:POKEZ,Q
305 IFF$="B"THENPOKEX-1,H:POKEZ-1,Q:J=122
310 REM**********CONTROLS**********
311 GETA$:IFA$=""THEN311
315 M=0
320 IFA$="■"THENM=+40
330 IFA$="■"THENM=-40
340 IFA$="■"THENM=1*S
350 IFA$="■"THENM=-1*S
360 IFA$="Z"THENY=160:D=160:H=160:Q=C(1)
370 IFA$="X"THENY=160:Q=8:D=J:H=76:GOTO380
380 IFF$="B"THENGOTO400
385 IFA$="←"THEN409
390 GOTO270
395 REM****MULTI-COLOUR CONTROLS****
400 IFA$="A"ANDH=160THENQ=C(1)
401 IFA$="S"ANDH=160THENQ=C(2)
402 IFA$="D"ANDH=160THENQ=C(3)
```

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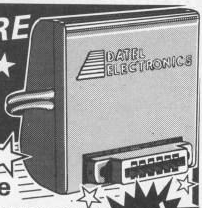

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```
403 IFA$="←"THEN640
404 GOTO270
408 REM******CALCULATING DATA******
409 PRINT"     PLEASE WAIT (CALCULATING DATA)":T=1
410 W=0:K=0
415 K=256
420 FORV=1TO8:G=P+V:F=PEEK(G)
430 IFF=160THENY(T)=G:T=T+1:GOTO460
445 KZ(V)=0:K=K-(K/2):GOTO500
460 K=K-(K/2):KZ(V)=K
500 NEXTV
510 P=P+8:W=W+1:L=L+1
515 PRINT"■              DATA LEFT          "I:I=I-1
530 AZ(L)=KZ(1)+KZ(2)+KZ(3)+KZ(4)+KZ(5)+KZ(6)+KZ(7)+KZ(8)
535 IFL=64THEN955
540 IFW=3THENW=0:P=P+16
550 IFF$="B"THEN730
565 GOTO415
580 L=0:PRINT"□"
590 IFL=63THENEND
600 PRINT"■   DATA",AZ(L), AZ(L+1), AZ(L+2):L=L+3
610 GOTO590
640 REM ******MULTI-COLOUR DATA******
700 PRINT"   ■PLEASE WAIT (CALCULATING DATA!)":T=1
710 P=55341:B=P:W=0
730 K=256:N=0:M=0
740 FORV=1TO8:G=P+V
750 F=PEEK(G)AND15
755 X=1069+(P-B+V)
756 IFPEEK(X)=76THEN790
757 IFPEEK(X)=122THEN790
760 IFF=C(1)THENM=0:N=1:GOTO785
770 IFF=C(2)THENM=1:N=0:GOTO785
780 IFF=C(3)THENM=1:N=1:GOTO785
785 Y(T)=X:CL(T)=F:T=T+1:GOTO810
790 M=0:N=0
810 K=K-(K/2):KZ(V)=M*K:K=K-(K/2)
820 V=V+1:KZ(V)=N*K
830 NEXTV
840 GOTO510
850 REM ******SPRITE TEST******
860 POKE(SM+39),C(1)
870 PRINT"□■■■■ PRESS SPACE BAR TO END MOVEMENT":POKE2040,13
880 FORN=0TO63:A=AZ(N):POKE832+N,A
890 NEXTN
900 POKESM+21,1
910 FORZ=50TO250:POKESM+0,160:POKESM+1,Z
911 GETA$:IFA$=""THEN913
912 IFA$=" "THEN952
913 NEXTZ
940 FORX=30TO250:POKESM+0,X:POKESM+1,120:NEXTX:GOTO900
950 POKESM+28,3:POKESM+37,C(1):POKESM+38,C(3):POKESM+39,C(2):GOTO870
952 REM ********MENU********
953 POKESM+21,0
955 PRINT"□"SPC(12)"■■MENU OF OPTIONS■■■■"
960 PRINTTAB(4)"■SPRITE DATA AND END F1■■■"
970 PRINTTAB(4)"DISPLAY SPRITE F3■■■"
980 PRINTTAB(4)"CHANGE SPRITE DESIGN F5■■■CHOOSE? "
990 GETA$:IFA$=""THEN1000
1000 IFA$="■"THEN580
1010 IFA$="■"ANDF$="B"THEN950
1020 IFA$="■"THEN850
1030 IFA$="■"THEN1043
```

```
1040 GOTO990
1043 PRINT"J"
1045 REM****CHANGE SPRITE DESIGN***
1050 FORA=1TO21
1060 PRINTSPC(6)"J"C$:NEXTA
1065 IFF$="B"THEN1110
1070 FORA=1TOT
1080 F=Y(A)-1071
1090 POKE1071+F,160:POKE55343+F,C(1):NEXT
1100 S=1:B=1:M=40:GOTO200
1101 REM**MULTI COLOUR DESIGN**
1110 FORA=1TOT-7
1200 F=Y(A)-1071
1205 S=CL(A)
1210 POKE1071+F,160:POKE55343+F,S
1230 POKE1071+(F+1),160:POKE55343+(F+1),S
1240 NEXT:S=2:GOTO200
1270 REM***END***
```

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```
 10 REM ******************************
 11 REM *                            *
 12 REM * UNIVERSAL DEC/HEX CONVERT *
 13 REM *                            *
 14 REM *       BY M. C. HART        *
 15 REM *                            *
 16 REM ******************************
 17 :
 18 :
 19 :
 20 REM MOST CBM DEC/HEX ROUTINES
 21 REM PUBLISHED SO FAR UTILISE
 22 REM THE PET MACHINE LANGUAGE
 23 REM MONITOR ROUTINES ABSENT IN
 24 REM THE VIC/CBM 64
 25 :
 26 REM  THESE ROUTINES ARE CONSTRUCTED
 27 REM  SO THAT THEY ARE AS INTER-
 28 REM  CHANGEABLE AS POSSIBLE BETWEEN
 29 REM  THE VARIOUS CBM MACHINES IF
 30 REM  YOU DECIDE TO UPGRADE/ADAPT.
 31 :
 32 REM DATA IS INCLUDED FOR BASIC4;
 33 REM BASIC2;VIC20 AND C-64 MACHINES.
 34 REM PEEK(57345) DETERMINES THE MODEL
 35 REM AND THE PROGRAM SELECTS THE
 36 REM APPROPRIATE DATA STATEMENTS,
 37 REM SKIPPING OVER THOSE WHICH DO NOT
 38 REM APPLY...
 39 :
 40 REM TO USE THIS TECHNIQUE EACH DATA
 41 REM LINE MUST BE 10 ITEMS LONG
 42 :
```

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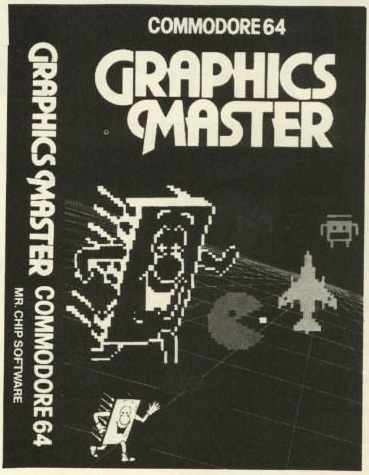

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```
43 REM: 150 CONVERSION HEX/DEC S/R
44 REM: 200 'SKIP' S/R
45 REM: 300 READ LINE S/R
46 :
50 REM       INSTRUCTIONS
51 :
52 REM SYS 850,----- (DLCIMAL-HEX)
53 REM SYS 940,$---- (HEX-DECIMAL)
54 :
100 REM       DATA LOADER
101 :
102 PRINT:PRINT"LOADING...":PRINT
110 FOR K=0TO117:READ L$:PRINTL$,:IFL$<>"*"THENGOSUB150:POKE850+K,X:GOTO130
120 MT=PEEK(57345)
121 IF MT=127 OR MT=54 THEN GOSUB300:FORJ1=1TO3:GOSUB200:NEXT:GOTO130
122 IFMT=72 THEN GOSUB200:GOSUB300:GOSUB200:GOSUB200:GOTO130
123 IFMT=220 THENGOSUB200:GOSUB200:GOSUB300:GOSUB200:GOTO130
124 IF MT=86 THEN FORJ1=1TO3:GOSUB200:NEXTJ1:GOSUB300:GOTO130
130 NEXTK:PRINT:PRINT"FINISHED":END
140 :
149 :
150 REM:HEX-DEC SUB-ROUTINE (BASIC)
152 X=0:FORJ=1TO2:L=ASC(L$):L=L-48+(L>64)*7:L$=MID$(L$,2):X=16*X+L:NEXT:RETURN
198 :
200 REM SKIP
210 PRINT:FORI=1TO10:READ L$:PRINTL$;" ";:NEXT:PRINT:PRINT:RETURN
220 :
300 REM READ A LINE
310 PRINT:FORI=0 TO 9:READ L$:PRINTL$,:GOSUB 150:POKE850+K+I,X:NEXT:K=K+9:PRINT
320 PRINT:RETURN
500 DATA *
501 DATA 20,F5,BE,20,84,BD,20,2D,C9,AA
502 DATA 20,F8,CD,20,8B,CC,20,D2,D6,AA
503 DATA 20,FD,CE,20,8A,CD,20,F7,D7,AA
504 DATA 20,FD,AE,20,8A,AD,20,F7,B7,AA
510 DATA 98,48,48,8A,48,48,A9,24,20,D2
520 DATA FF,68,20,78,03,68,20,7D,03,68
530 DATA 20,78,03,68,20,7D,03,60,18,6A
540 DATA 6A,6A,6A,29,0F,18,69,30,C9,3A
550 DATA 90,02,69,06,20,D2,FF,60
560 DATA EA,EA,EA
569 :
570 DATA *
571 DATA 20,70,00,C9,3A,29,0F,90,02,69
572 DATA 20,70,00,C9,3A,29,0F,90,02,69
573 DATA 20,73,00,C9,3A,29,0F,90,02,69
574 DATA 20,73,00,C9,3A,29,0F,90,02,69
580 DATA 08,60,20,8F,03,0A,0A,0A,0A,85
590 DATA 23,20,8F,03,65,23,85,23,60
599 :
600 DATA *
601 DATA 20,70,00,C9,24,F0,03,4C,00,BF
602 DATA 20,70,00,C9,24,F0,03,4C,03,CE
603 DATA 20,73,00,C9,24,F0,03,4C,08,CF
604 DATA 20,73,00,C9,24,F0,03,4C,08,AF
610 DATA 20,9B,03,85,22,20,9B,03,A5,22
619 :
620 DATA *
621 DATA A6,23,20,83,CF,4C,FF,B3,EA,EA
622 DATA A6,23,20,D9,DC,4C,89,C3,EA,EA
623 DATA A6,23,20,CD,DD,4C,74,C4,EA,EA
624 DATA A6,23,20,CD,BD,4C,74,A4,EA,EA
READY.
```

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Neil Thacker of Long Eaton sends this program for the unexpanded Vic 20

THIS GAME is a shootout between two cowboys. To get at your opponent you have to cross the prairie, avoiding the tumbleweed which moves across the screen.

Controls for Player one are W, A, X, D, and S for up, left, down, right and fire; controls for Player Two are P, L, ., ;, and :.

When a player is shot he explodes, and the winner is indicated with a caption and a musical phrase.

```
 1 A=7705:B=7727:C=7728:D=7749:E=7750
 2 F=8116:G=8138:H=8137:I=8160:J=8161
 3 POKE36878,15
 5 PRINT"■":POKE36879,27
10 PRINT"■■■■■■■■■GUNFIGHT"
15 PRINT"■■  THIS GAME NEEDS 2"
20 PRINT"■  TO PLAY IT ALSO "
25 PRINT"■ NEEDS A LOT OF SKILL."
30 PRINT"■■   BY NEIL THACKER"
35 PRINT"■■■■■■■■HIT F1 TO GO ON"
40 GETA$:IFA$=CHR$(133)THENGOTO50
45 GOTO40
50 PRINT"■"
55 PRINT"■■■■■■■■■GUNFIGHT"
60 PRINT"■■■   1)            2)
65 PRINT"■   W              P"
70 PRINT"■ A S D          L : ;"
75 PRINT"■   X              ."
80 PRINT"■■ THE KEY IN THE MIDDLE"
85 PRINT"■       IS FIRE."
90 PRINT"■■■■■■■■■GOOD LUCK."
95 PRINT"■■■■■■■HIT F1 TO START"
100 GETB$:IFB$=CHR$(133)THENGOTO110
105 GOTO100
110 PRINT"■":POKE36879,138
114 P=7856
115 GETC$
116 POKEP,102:P=P+3
117 IFP>7988THENGOTO114
118 IFP=ATHENGOTO600
119 IFP=BTHENGOTO600
120 POKEA,81:POKEB,102:POKEC,64:POKED,101:POKEE,101
121 IFP=CTHENGOTO600
122 IFP=DTHENGOTO600
123 IFP=ETHENGOTO600
124 IFP=FTHENGOTO500
125 POKEF,81:POKEG,102:POKEH,64:POKEI,101:POKEJ,101
126 IFP=GTHENGOTO500
127 IFP=HTHENGOTO500
128 IFP=ITHENGOTO500
129 IFP=JTHENGOTO500
130 IFC$="A"THENA=A-1:B=B-1:C=C-1:D=D-1:E=E-1
135 IFC$="D"THENA=A+1:B=B+1:C=C+1:D=D+1:E=E+1
140 IFC$="W"THENA=A-22:B=B-22:C=C-22:D=D-22:E=E-22
145 IFC$="X"THENA=A+22:B=B+22:C=C+22:D=D+22:E=E+22
150 IFC$="S"THENGOTO200
151 Z=C+1
155 IFC$="L"THENF=F-1:G=G-1:H=H-1:I=I-1:J=J-1
160 IFC$=";"THENF=F+1:G=G+1:H=H+1:I=I+1:J=J+1
165 IFC$="P"THENF=F-22:G=G-22:H=H-22:I=I-22:J=J-22
170 IFC$="."THENF=F+22:G=G+22:H=H+22:I=I+22:J=J+22
174 Q=H-1
175 IFC$=":"THENGOTO300
180 PRINT"■":GOTO115
200 FORY=1TO10:POKE36877,223:NEXTY:POKE36877,0
205 POKEZ,46
206 IFZ=C+18THENGOTO115
207 POKEP,102
210 Z=Z+1
220 IFZ=FTHENGOTO500
225 IFZ=GTHENGOTO500
230 IFZ=HTHENGOTO500
235 IFZ=ITHENGOTO500
240 IFZ=JTHENGOTO500
245 POKEA,81:POKEB,102:POKEC,64:POKED,101:POKEE,101
250 POKEF,81:POKEG,102:POKEH,64:POKEI,101:POKEJ,101
255 PRINT"■":GOTO205
300 FORU=1TO10:POKE36877,223:NEXTU:POKE36877,0
305 POKEQ,46
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 335 IFQ=DTHENGOTO600
 340 IFQ=ETHENGOTO600
 345 POKEA,81:POKEB,102:POKEC,64:POKED,101:POKEE,101
 350 POKEF,81:POKEG,102:POKEH,64:POKEI,101:POKEJ,101
 355 PRINT"■":GOTO305
 500 POKEA,81:POKEB,102:POKEC,64:POKED,101:POKEE,101
 505 POKEF,81:POKEG,102:POKEH,64:POKEI,101:POKEJ,101
 510 F=F-22:G=G-1:H=H+1:I=I+23:J=J-23
 515 IFJ<7680THENGOTO1000
 520 PRINT"■":GOTO500
 600 POKEA,81:POKEB,102:POKEC,64:POKED,101:POKEE,101
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 610 A=A-22:B=B-1:C=C+1:D=D+23:E=E-23
 615 IFE<7680THENGOTO2000
 620 PRINT"■":GOTO600
1000 POKEA,81:POKEB,102:POKEC,64:POKED,101:POKEE,101
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1011 IFU=240THENGOTO1030
1015 POKE36874,U
1020 NEXTU
1025 GOTO1015
1030 FORP=240TO135STEP-5
1035 POKE36874,P
1040 IFP=135THENGOTO3000
1045 NEXTP
1050 GOTO1030
2000 POKEF,81:POKEG,102:POKEH,64:POKEI,101:POKEJ,101
2005 POKEH+64,23:POKEH+65,9:POKEH+66,14:POKEH+67,14:POKEH+68,5:POKEH+69,18
2010 FORT=135TO240STEP5
2015 IFT=240THENGOTO2050
2020 POKE36874,T
2025 NEXTT
2030 GOTO2000
2050 FORR=240TO135STEP-5
2055 IFR=135THENGOTO3000
2060 POKE36874,R
2065 NEXTR
2070 GOTO2050
3000 PRINT"■":POKE36874,0:POKE36879,10
3001 PRINT"■■■
```
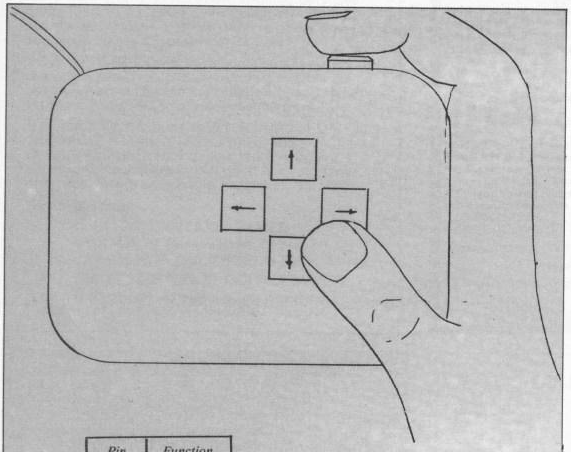
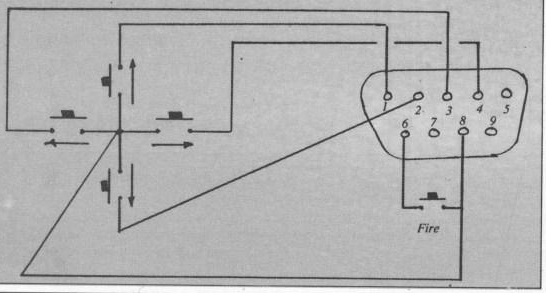

Build a joystick

***J Whitfield** explains how to construct one of the most useful games peripherals simply and cheaply*



Pin	Function
1	Joy0
2	Joy 1
3	Joy 2
4	Joy 3
5	Pot Y
6	Light pen
7	+5v
8	Ground
9	Pot X

Type one



THE FIRST peripherals all computer owners seem to want are a pair of joysticks. Many of the joysticks that are commercially available seem to be very vulnerable to damage, particularly by the younger members of a family. An alternative joystick can be constructed using very few components, yet being both robust and reliable.

The Vic 20 and CBM64 offer the choice of two different types of joysticks. For most game programs, a joystick comprising only of five switches is required. Four switches are set out to represent the four cardinal points of the compass, and the fifth switch is of course the fire button.

The second type of joystick has the directional switches replaced by two potentiometers, representing the "X" and "Y" axes. This system allows the computer to digitise each axis into 255 units, and store the values in location registers from where they can be read using the PEEK or LDA commands.

Components for type 1 are:—
one standard 'D' socket with cover;
five push to make switches;
one metre of light 5 core cable;
and one container.

Components for type 2 are:—
one standard 'D' socket with cover;
two linear 100kohms slide potentiometers;
two 0.1mfd. capacitors;
one metre of light 5 core cable;
and one container.

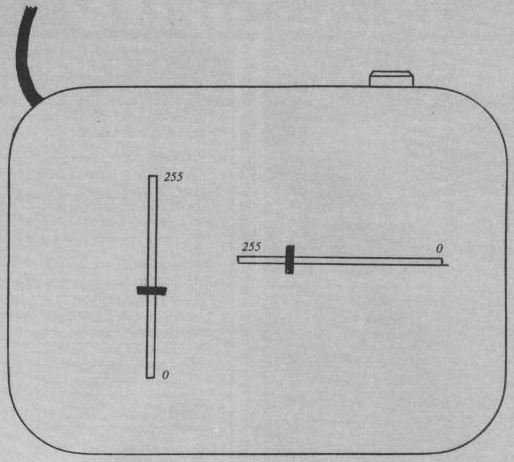
The container size may be dictated by the size of the other components, but remember it needs to feel comfortable in the hand. I used a tobacco tin. If you are unfamiliar with potentiometers, you will need to know a few points. Two main types are available, "log" and "lin". These terms refer to the way the resistance changes as the "wiper" is moved from one end of the potentiometer to the other. Log is short for logarithmic, and lin for linear. Linear pots are required for this project. If a "log" type is used, the result would be that instead of the joystick values changing from 0 to 255 in proportion to the amount the controls are moved, the values would change mainly at one end of the movement.

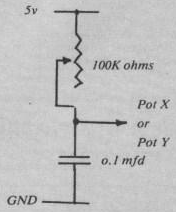
The number of pins or solder lugs on a slide pot could be 3,4,6 or 7. 3 pins are on a standard pot, one for each end of the resistor with the "wiper" between them. 6 pins indicates there are two pots in one case, of which only one is connected. See illustration. 4 or 7 pins means a screen or earth has to be provided, in this example it need not be connected.

Now for a few helpful construction hints. Mount the controls in the base of the tin, the exact positions being determined by their size and your preference. Wire the components, taking great care to keep all exposed wires as short as possible to prevent any change of electrical shorting.

The small numbers in the illustration are the socket's numbers shown at each connection, so join point 7 to socket 7, and so on.

Finally, check your wiring thoroughly before plugging the joystick into the computer!■


255
0
255
0


5v
100K ohms
Pot X
or
Pot Y
o.1 mfd
GND

Type two

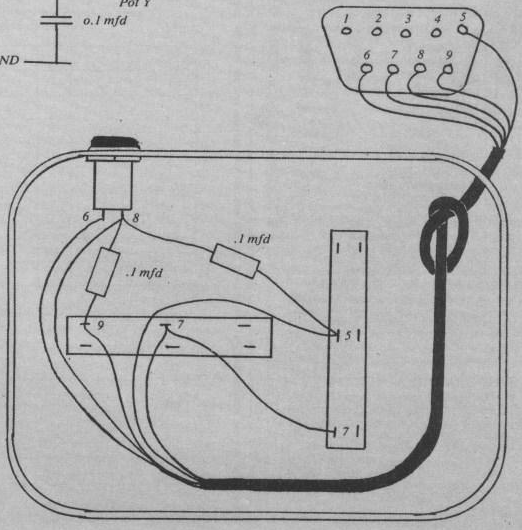

1 2 3 4 5
6 7 8 9
6
8
.1 mfd
.1 mfd
9
7
5
7

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Image and reality

FOR AN American company, Commodore has a curious image problem. In Britain, they have for months enjoyed a purple patch. The 64 is outsold here only by the much cheaper Spectrum, Commodore has received, for a foreign company, the rare accolade of a Queen's Award, and now there is the crowning glory, in PR terms, of Commodore choosing Corby for its 1,000 job, £20 million factory to make the Vic 20 and the 64.

But as chairman Irving Gould and new chief executive Marshall Smith enjoyed the pleasant after-glow of hitting the front pages of Britain's national newspapers and making the TV news, they were already working hard at shoring up Commodore's shaky reputation back home.

For in spite of having comfortably 40% of the US micro market, with no signs of consumer demand for the 64 abating, now accounting for half Commodore's sales, and with one of the few remaining rivals Coleco losing 35 million dollars in a single quarter and laying off 1,300 staff, Commodore has found it hard to find favour on Wall Street. Indeed, last October when Commodore lifted first quarter earnings a "mere" 80%, dealers promptly marked the shares down five dollars, to 34½ dollars.

And there, give or take a dollar, they have lingered.

The financial community is not grumbling about Commodore's results, mind you. Second quarter earnings, up to last December, were more than doubled at 50.1 million dollars on sales of 431.4 million dollars, against 681.2 million dollars for the whole of the 1982 – 3 year.

But in recent months, there have been too many tactical own goals which contrast sharply with Commodore's carefully created British image. The departure of founder Jack Tramiel, if a timely move, was far too abrupt and prompted reports of a boardroom rift, and a five dollar share tumble.

Although the appointment of a 'professional' replacement in Marshall Smith, with a solid if unrelated record at Thyssen-Bornemissa, has inspired confidence, the reverse could be said of a spate of resignations by top executives.

More worryingly, dealers have been far from happy at Commodore's reliance on mass distribution outlets like K-Mart, and indeed in December, a newly set-up Coordinating Committee for Commodore Lawsuits wrote to dealers asking if they needed legal help.

Although they won't publicly admit it, privately the word from Commodore officials has been that with the six largest "mass merchandising" chains representing 40% of the group's sales, there was no need to worry about small dealers.

But now there's been a change of tack at Commodore. In March, Gould and Smith made a symbolic attempt to woo Wall Street with a meeting to sweet-talk 100 analysts and dealers.

Gould has confessed: 'This time, we'll try to do things properly the way they should have been done.' Said Smith: 'We are very conscious that we need two channels of distribution — the mass-merchandising and a strong dealer organisation'.

Such humility will no doubt help the Commodore image in the US, but is far from disinterested. Although Commodore is likely to launch a cheap 100 dollar 16K micro in Britain, the whole emphasis in the future is on more up market models, on the 264, and the portable to take on IBM.

Now while it may be all right to push Vic 20s out to the masses via K-Mart, it's not the best way to promote a portable, which is where those dealers out in the cold might just come in useful. Still, it's a step in the right direction.

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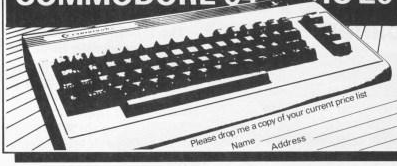

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ANSWER BACK

Sprite pointers

WE'RE WORKING on 64 program using redefinable characters and sprite data. Our problem is where to position the data to access it through sprite pointers (POKE 2040,x), without our Basic program overwriting the data.

Ian Moss and Paul Garrett
Deal
Kent

THE 64 MEMORY is divided into 4 banks of 64K each. At any given time only one bank may be used for character and sprite data being screened.

Your Basic memory requirements preclude use of banks 0 to 2, so you must program the 64 to use bank 3 + C000 to FFFFI. There is 4K of RAM between C000 and D000 which can be used for your character and sprite data. You can also copy across from D000 to DFFF any existing characters that you may require, but remember that the character ROM is only made readable by poking it in. You will also need to reserve 1K of the 4K for a screen memory map.

The memory pointers for screen memory and character memory will also need changing. Details of setting up memory pointers are given in the *Programmer's Reference Guide,* pages 101 to 106.

Monitor choice

I REQUIRE a machine code monitor for my 64, and have narrowed my choice down to the Audiogenic Monitor and Hesmon 64. Could you advise which is more powerful, and hence the better buy? They are both useable with CBM printers, but does this include the 1520 printer – plotter? Also, how much memory does the 64 loose when using hi-res graphics?

J S Westerman
Ambleside
Cumbria

I PERSONALLY use a free XMON public domain monitor from the ICPUG library, which I find adequate for most purposes. I have not used either of the monitors you mention, but I hear that the Audiogenic one has a slight edge.

The 1520 printer – plotter has a device number of 6, not 4, so should be useable if this is altered. Set location SBA (decimal 186) to 6 in your machine code routine.

The hi-res on the 64 is available through bit-mapping of the screen. Each pixel requires a location in memory, and each character is 8 by 8 pixels. Since there are 40 lines of 25 characters the resolution is 320 × 200 = 64000 bits. At eight bits to the byte, this means that you will lose up to 8Kbytes when using hi-res mode.

Cable trouble

THE WIRES in the DIN plug cable of my Vic 20 fell off the pins. Not knowing which colour cable led to which pin, I guessed and soldered them back on, but lost the sound on the computer.

Can you tell me which wire should have gone where, and whether a mistake might have lost the sound?

Craig Murphy
Oxford

LOOKING into the DIN plug with the groove upwards, the lefthand pin is audio (red), the next video high (black), the centre pin ground (green), the next video low (white), and the rightmost pin + 5v (yellow). If necessary you can test with a multimeter, since lead colours may vary.

Stack attack

COULD YOU tell me anything about the Stack Light Rifle? I'm very interested in buying one, but would like to know more about it first.

Joe Theis
Wheathampstead
Herts

THE STACK LIGHT RIFLE is an extension of the idea of a light pen. It consists of a plastic gun with a 12 foot cable. In the barrel is a photosensitive cell, which can detect lighter areas on the screen when the trigger is pressed. Three games are supplied on cassette with the SLR: High Noon Shootout, The Glorious Twelfth, and Gallery. Anirog Software also manufactures several games for the SLR, which plugs into the joystick port of the 64.

Contact Stack Computer Services, Derby Road, Bootle, Liverpool, phone 051-933-5511.

Disk query

I OWN A 64, and was recently loaned a CompuThink twin disk unit which has been used with a Pet. Is it possible to link this disk drive to the 64? And what disk operating system would be required?

R W Gregory
Colchester

TRY *Programming the Pet – CBM,* by Raeto West, published by Level Ltd, PO Box 438, Hampstead, London.

Convert Basic

COULD YOU recommend any books which would advise me how to convert Basic programs for other computers to the Basic of the Commodore 64?

B R Lloyd
Southend
Essex

GET THE *Programmer's Reference Guide for the 64,* and in chapter 2 you will find a list of the commands available on the 64. Comparing a similar list of keywords for another machine should tell you what the equivalent command is.

You will then have to write a routine to imitate the keyword; of course this program will be longer.

Counting in code

I HAVE some queries regarding the use of assemblers and machine code on the 64. It seems to me that the only way I can set up a loop which counts to more than 255, and which refers to memory locations as well, (e.g. when zeroing the 8000 bytes of character memory for hi-res graphics) is to use indexed indirect addressing, for instance STA (aa,X).

I don't see how any address can be referred to otherwise if the increments rise above 255. Am I correct? If so, how can I be sure that the zero page address I use is free and not being used by the computer?

K Scheerly
Chandler's Ford
Hants

TO MOVE large blocks of memory you cannot use a single index register, since eight bits are not enough to store a number greater than 255. Since you need sixteen bits, the pointers to the memory to be moved must be stored in the memory. An example of an assembler source program to do this follows;

```
LDA # Source low
STA Origin; stores address of data to be moved
LDA # Source hi;
STA Origin + 1;
LDA # To low;
STA Newdest; stores destination address of data
LDA # To hi;
STA Newdest + 1
LDX # Blocks; how many blocks
LDY # 0 ; size
Loop 1;
LDA (Origin),Y; read byte
STA (Newdest),Y; transfer byte
DEY; update counter
BNE Loop 1; when Y back to 0 (i.e. after 256 bytes transferred)
Loop 2; INC Origin + 1; another block of source
INC Newdest + 1; another block of destination
DEX; counter
BMI Exit; check for last block
BNE Loop 1; Y is 0
LDY # remainder; for part block at end to be moved
BNE Loop 1; if none then exit
Exit RTS
```

If you need help with a technical query or problem write to Jack Cohen, Commodore Horizons, 12-13 Little Newport Street, London WC2R 3LD

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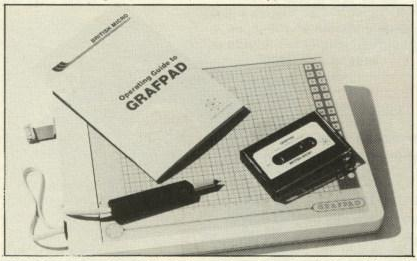
COMPETITION CORNER

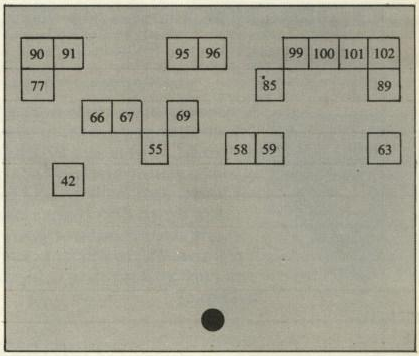
Win a British Micro Grafpad

***Tony Roberts** sets the problem*

Send your answers to Competition Corner, Commodore Horizons, 12-13 Little Newport Street, London WC2R 3LD — to arrive no later than the last working day in the month on the cover of this issue. The name of the winner, and the solution to the puzzle, will be published in the issue after next. Entries will not be acknowledged and we cannot enter into correspondence on the result



SCREEN DISPLAY



EVERYONE at the Hell Nook Micro Club had stopped playing with their individual micros to gather round Augustus, who was about to crack all records playing the club's own version of the popular micro game, Breakout.

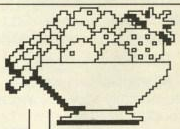
In this version, the ball (see the screen display) can be "shot" in any direction, simply by specifying the block (they are all numbered) at which it should be aimed. As it hits a block, it always bounces off at an angle of 45 degrees from the surface, the block disappears, and a score is made. If the ball hits the sides or top of the screen, the same thing happens — but the ball itself disappears if it touches the bottom of the screen. Augustus has managed to destroy all the blocks except those shown here with his first nine shots — with his last shot, he can destroy the rest, but which block should he aim at?

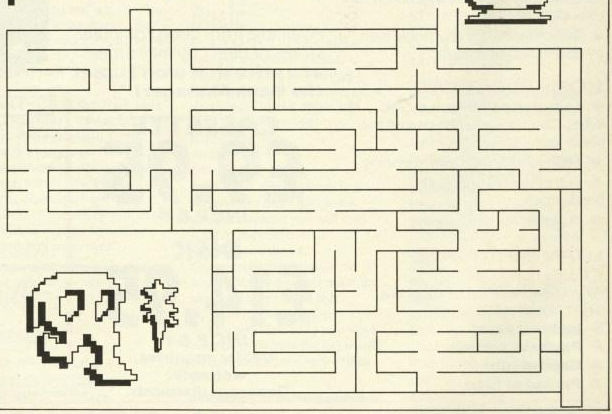
Simply give the number of the correct block, and complete the tie-breaker sentence in an apt, original and amusing manner in 15 words or less. This month's prize is the Grafpad from British Micro. The Grafpad enables you to produce graphic designs using the full capabilities of your 64, with the help of a stylus and a menu section. So the tie-breaker sentence is "I want to own a British Micro Grafpad because . . ."

The winners of our April competition are G. Benton of Kettering and David Wallis 3-D Silicon Fish from Thor Software.

from Romford. They'll each receive an Adman Electronics Speech Synthesiser, together with a bonus package of two talking games; Twin Kingdom Valley from Bug-Byte, and 3-D Silicon Fish from Thor Software.

Melbourne House presents Horace





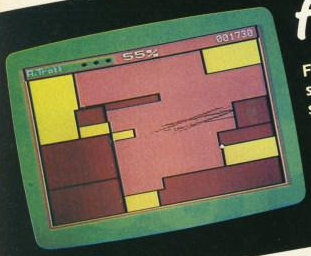
HORACE is a loveable little rogue who first appeared in a park on the Spectrum, picking the flowers and eating the keepers' lunches. Now Melbourne House is giving 20 of our readers a chance to win a copy of the Commodore 64 version of either Hungry Horace or the follow-up Horace goes Skiing.

Just mark in Horace's path through the maze to the food and send the completed entry to us with your name and address attached. As a tie-breaker, complete the following sentence in less than 15 words: "I want to own a copy of Hungry Horace/ Horace goes Skiing (delete as appropriate) because . . ."

Your entries must arrive by the last working day in June and the winners will be announced in our August issue.

SUPERSOFT

the name to remember



for games

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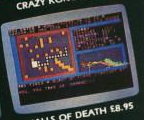
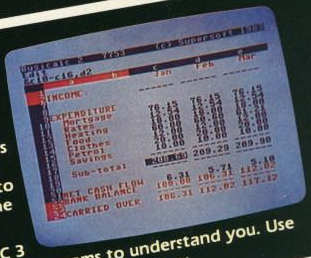


HALLS OF DEATH £8.95

for business

Show your computer who's master with BUSICALC!
Spreadsheet programs are used by large and small businesses to juggle with figures, prepare reports and so on. Some are very powerful indeed. The problem is that they're difficult to learn, and tricky to use – which is why we came up with the BUSICALC series.



Whether you choose BUSICALC 1, BUSICALC 2, or BUSICALC 3 you'll get a program you can understand – and one that almost seems to understand you. Use it in the home, use it for teaching, use it at work – it'll save you time and money.

for programmers

MIKRO is a full 6502/6510 ASSEMBLER with the power that professional programmers need, yet so simple to use that we recommend it to beginners! The MIKRO cartridge has many other facilities including editing commands and a machine language monitor, all for £57.50.

There's much more for the 64 in the SUPERSOFT catalogue. Ask your computer dealer for a copy, or phone 01-861 1166.

The Best 64 Software

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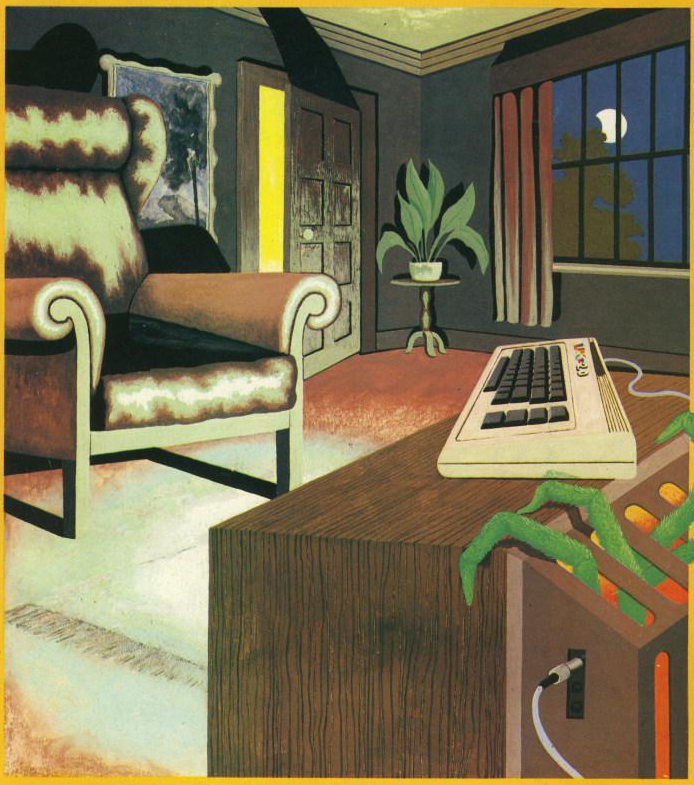

...never turn your back on them.

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